A TREATISE OF FRUIT-TREES,

SHEWING

The manner of *Planting*, *Grafting*, *Pruning*, and ordering of them in all respects, according to *Rules* of *Experience*.

Gathered in the space of Thirty seven Years.

Whereunto is Annexed,

Observations upon Sr. *Fran. Bacons* Natural History, as it concerns Fruit-trees, Fruits, and Flowers.

ALSO,

Directions for Planting of Wood for Building, Fuel, and other uses; whereby the Value of Lands may be much Improved in a short time, with small Cost and little Labour.

The *Third Impression*, Revised, with Additions, By *R. A. AUSTEN*, Practiser in the Art of Planting.

Deut. 20. 10. *Thou shalt not destroy the Trees, being Trees for meat; for the Tree of the Field is mans life.*
Amos 4. 4. *They shall Plant Gardens, and eat the fruits of them.*

OXFORD,
Printed by *William Hall*, for *Amos Curteyne*, 1665.

IMPRIMATUR

ISTE LIBER

ROBER. SAY,

June the 9th
1665.

VICE-CANCEL.
OXON.

TO THE

HONOURABLE

ROBERT BOYLE Esq;

The Worthy

PATRON and EXAMPLE

Of all

VERTUE.

Honoured Sir,

AMong other of your many Learned and Profitable Labours, (which have much Inlightned the World) You have been pleased (together with the Ho-

nourable and Royal Society, whereof You are a Worthy Member) to take into Consideration the Work of Planting and Preserving all sorts of Trees; not onely of Forrest-trees for Building, Fuel, and other uses, but also of Fruit-trees, especially in Relation to (the most wholsome Drink) Cider; which hath (together with many other of Your undeserved Favours towards me) imboldned me to make this humble Address unto You, intreating Your Favour and further Help in this good and profitable Work. And conceiving that I have so much Interest in Your Honours Favour, as to have liberty to make such Proposals unto You, as concern the Profit of the Publique (not

doubting

doubting of Your good acceptance of them) I do humbly submit these following particulars to Consideration, which I judge to be material, if not necessary, as to many persons.

1. First, *That there be a Law made to enjoyne the Work, as we have in other Cases of far less concernment then this; and according to the* Example *of other Nations in the same thing: For although many that are Ingenious Persons, will not need such an Excitement, yet the Common vulgar People (which are the greatest part of the Nation) will do but little without it.*

2. Secondly, *That there be* Overseers or Officers *appointed to look after the Work, from year to year, (without which, some Laws*

will have but a feeble Execution) *and these* Overseers *to have due Encouragement one way or other: This is no more then what is done in other Cases of far smaller advantage then this would be.*

3. Thirdly, *That there be* Books Printed and Published *for instruction in this business, which may have these Characters.*

1. First, *That they be of small* Bulk *and* Price; *Because* great Volumns (*as many are upon this Subject*) *are of too great a Price for mean Husbandmen to buy; as also take up more time to peruse then they can spare from other Labours.*

2. Secondly, *That the* Stile and Expressions be plaine, and

suited

ſuited to the Vulgar (*even to the Capacities of the meaneſt, for theſe (Generally) muſt be the Workmen and Labourers thereabout. Now, we know that many Pieces upon this Subject, are in* Latine, French, *and other* Tongues; *yea, and ſome that are in* Engliſh; *being the Works of ſome Learned and Eminent Perſons, (whoſe Faculties are raiſed by Study and Education, far above the reach of common Capacities) their* Expreſſions *are anſwerable, and therefore not ſo* profitable *to the Vulgar, though Excellent in themſelves, and very uſeful unto thoſe that underſtand them: But when Men are ſpoken to, and taught in any* Art *in their own* Language, (*in their common*

fami-

familiar stile) things are more easily received, and take the deeper Impression in their minds, and are better remembred.

3. Thirdly, *That* these Books for Instruction, be Experimental; *according to what is tried and practised from* year *to* year.

Many that have Written upon this Subject (especially some Antient Authours) *have been meerly* Contemplative men; *and have presented us with little else but their* Notions *and* Apprehensions: *And though some things may be* rational *and* useful, *yet many are not so, which when they come to be tryed by the* Touchstone of Experience, *fall off and deceive men, to their loss of* Time, Cost,

Coſt, *and* Labour, *with* diſcouragement; *and diſcover themſelves* (*as* Sir Francis Bacon *obſerves in his* Advancement of Learning) *to be but meer* Putative things: *And hereunto he adds*, That it were to be wiſhed, (as that which would make Learning indeed ſolid and fruitfull) that Active or Experimental men, would, or could, become Writers: *And the oftner* Experience *in things is renewed and repeated, from year to year, the more it is Confirmed, and ſo fitteſt to be* Communicated *and* Practiſed.

Now, how that which is here done (*in the enſuing work*) *anſwers to theſe things, I leave to others to*

Judge,

Judge, not doubting but that You [*Honoured Sir*] *will continue your* Endeavours *for the* carrying *on this good and profitable* Work of Planting. *A Work wherein not onely the most Learned* Philosopher, *and* Exquisite Indagatour *into the* Mysteries *of Nature, may* exercise *his* Judgment, *and please his* Mind; *but also a work* Pregnant *with* Profits, *Real and Substantial to all* people *all their life long, from the* Cradle *to the* Grave: *A Work that* (*instead of* empty *and* fruitless speculations) *will fill the* Belly *and cloath the* Back. *A Work that will enrich the* Poor, *and adorn the* Rich: *A Work that will* Encrease *the* Kings Revenues, *and the* Substance

ſtance of all his Subjects; A Work Praiſed and Practiſed by the Greateſt and moſt Eminent Perſons in all Ages. In a word, It is a Royal Work, and worthy the moſt ſerious Conſiderations and Endeavours of the Royal Society; whereby thoſe Worthies may raiſe to themſelves perpetual Honour, as being Inſtrumental to promote and carry on the ſame, to a greater and more general profit.

Wherefore (Worthy Sir) You being a principal Wheel in this great and famous Engin, (framed on purpoſe for great and profitable Works) are able to move it ſtrongly and effectually to that end; which that you would be pleaſed to

do

do, is earnestly desired; whereby you may engage, not onely the present Age, but also many Generations to come; to be acknowledged by many, but especially

SIR,

By Your already greatly obliged Servant,

TO THE READER:

THE *Art of Planting fruit-trees* is (among Antient Authors) called *Husbandry*, being it is one part of the Husbandmans work, though in many parts of this Nation Husbandmen have little skill in it, their labour being chiefly Tillage of the ground for Corn. But this is a part of the Husbandmans work as well as that; yea, and the chiefest and worthyest part. *Adam in time of his Innocency* was imployed in this part of *Husbandry* about *Fruit-trees*, as is shewed pag. 22.

Quid sit Agricultura. vid. p. 11.

But when he had sinned, he was put away from this work to Till the ground, a lower and inferior labour. *Gen. 3. 23. The Lord*

Lord God sent him from the Garden of Eden *to till the ground.*

We see likewise the Scripture calls it *Husbandry*: *Noah* is called an *Husbandman* when he Planted a *Vineyard*, Gen. 9. 20. God (blessed for ever) is called an *Husbandman*, for that he Pruneth, Purgeth, and ordereth his *Mystical Vine-tree the Church*, Joh. 15. 1. So that I shall keep the phrase throughout the Work.

I have seen (I suppose) the best Works, both of antient and late Writers upon this Subject, and have *learned* from them what I could, for the accomplishing of this Art, and have observed the practise and experiments of many from time to time, concerning it, and have improved them to my own advantage.

And likewise I have set myself to the *Practise* of this work about Thirty and seven years, endeavouring to find out things of use and profit, by *Practice* and *Experience*, that I might speak upon better and surer grounds, than some others who have written upon this Subject; for *Experience* guides, and informs *Reason* in many things in which (without *Experience*) it would often erre. Some who have taught this *Art of Planting Fruit-trees*, have been in it only *Contemplative men*, having little or no

Experi-

Experience in it; ſo that in many things they have erred, and that groſly, as ſhall appear in due place; See pag. 165, 166, &c.

A Learned Author ſayes, *The writings of ſpeculative men upon active matter, (for the moſt part) ſeems to men of Experience to be but as dreams and dotage:* L. Ba. Advanc. Lear.

Study and *Practiſe* (by degrees) frame new Arts, and add to the old:

Per varios uſus Meditando extunderet Artes: paulatim. Virg. Geor.

Experience is called *the Perfecter of Arts, and the moſt ſure and beſt teacher in any Art: Contemplation* and *Action* are the two legs whereon Arts run ſteedily and ſtrongly, and the one without the other can but hop, or go lamely: They are the two *Eyes* wherewith men ſee Natures ſecrets clearly, but the one alone diſcerns but dimly. And hence it follows, that ſome who were only Contemplators of nature without experience, and would needs adventure to write, and give inſtructions touching the *Practique* part of *Planting Fruit-trees*, have in many things (as the aforeſaid Author ſayes) preſented us with

smoak, instead of the *lucide flames of light*: They have indeed shewed us a comly and beautiful body, Painted according to Art, but yet lifeless and without a spirit, and have offered us shells and husks instead of kernels.

But now, *speculation* and *action*, are as Soul and Body united, which labouring together, work out both *Profit* and *Pleasure*, many advantages to our selves and others. *Experience* (as a Philosopher says) is the *Root of Art*, and it may well be so called, from which springs a numerous multitude of new *Experiments*: for from one *Root*, or single *Experiment*, (though perhaps a poor and mean one in it self) if throughly weighed with reason and judgment, may arise many rich and rare inventions: And its most true, which the Lord *Bacon* sayes to this purpose: *As through a small hole or cranny, a man may see great Objects; so through small and contemptible instances, men may see great Axioms, singular secrets of nature.* Men will labour hard, and a long time in some labours full of hazard and danger, and perhaps unjust too, and all for a *little profit*; but here, in this employment, men may with a *little labour*, in a short time, without *hazard* or *danger*, and that *justly*, obtain great and

many *Profits*, and those with pleasures superadded.

Works, and labours, which have in them but a vain and unprofitable pleasure, are approved but onely of some sensual persons; and such labours as have but onely *Profit*, and do not ease the Pains with some *pleasantness* in them, are yet harsh, and disliked of many, but such as yield both *Profit* and *Pleasure*, are universally liked, and allowed of all, according to the Poet,

Omne tulit punctum, qui miscuit utile dulci.

Either of these is the better, because of the other joyned with it, when they run along hand in hand; the Profit is the more, because of the Pleasure; and the Pleasure is more, because of the Profit.

Now therefore, That men may obtain yearly, a plentiful Harvest of *Profits* and *Pleasures*, I have endeavoured to remove whatsoever might hinder; and have laid down some Arguments of Encouragement to set upon, and prosecute the means to obtain them; discovering the best way I can find out, how they may be gotten with most speed, and kept with most security.

If any man think the *Divine* and *Humane*

mane Arguments (preceeding the work) to be needless, because generally men know, that Planting *Fruit-trees* is a very profitable work, none doubt it.

I Answer; Some know it by *Experience*, many others do not.

And although men are *convinced* of the profitableness of the work, yet there is need of some quickning *Motives* to it, as to some persons; And I know none more prevalent than those taken from Profits and Pleasures, considered in so great and so many respects.

Accept of what is made ready at present, which as it may be profitable to some in respect of Encouragements and Directions in the practise of the Work, so also I desire it may be a means to stir up others to do something in the like kind for *Publique profit*.

There are many gobd Wits exercised about Toys and Trifles: some men bestow excessive *Time*, *Cost*, and *Labour*, about meer shadows, empty speculations; and well deserve *Martials Motto*.

Turpe est difficiles habere nugas.
Et stultus labor est ineptiarum.

While they might in the mean time, by

 the

the Study and Practiſe of this Art, (in ſearching out many hidden *ſecrets of nature and experiments*) much advantage themſelves, and many others, both in reſpect of *Temporals* and *Spirituals*. An Antient Authour ſayes, *Not he that knoweth many things, but he that knoweth things Fruitful is Wiſe.*

This Art is a full Store-houſe, out of which may be brought both Meat, Drink, and Money: It is a Rich *Mine*, without bounds or bottome, out of which we may dig *profits* and *pleaſures*, great and many, and worthy the ſtudy and labour of the moſt Wiſe and Learned, and may be called the *Philoſophers-ſtone*, (virtually and effectually (though not properly) for it turns, by the help of nature (though not Metals, yet) *Trees* and *Fruits*, yea, *Earth* and *Water*, into *Gold* and *Silver* in a ſhort time.

The good of this Imployment, both in the *Theorique* and *Practique part*, ſpreads it ſelf *over all places in the world, to all perſons in the world, from the Cradle to the Grave; from the beginning of the world, to the end of it*; ſo that no work can be more univerſally good than this.

Now therefore, ſeeing there is ſo much profit and advantage to be received from

this imployment of *Planting Fruit-trees*, both in *Temporal* and *Spiritual* respects. Let us set about it, and labour in it, either with body or mind, or both, That thereby the *Glory of God*, and *publique profit* (together with our own advantages) may be promoted,

The blessing of God go along with us, and give the increase in all our labours, and prosper the works of our hands.

This is my advice to men, and Prayer to God. Who am

Thine in the best Services,

R. A: AUSTEN.

THE

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Planting of Fruit-Trees,

The best way of improvement of *Lands.*

THE *Profits of Orchards and Gardens,* and also of planting *Fruit-trees* in the *Fields* and *Hedges,* (especially by *Cider* and *Pery*) are very well know to many in this Nation, so that the things I here speak of to men, are not doubtfull and questionable, whether advantages will arise or no, when they have bestowed their time, & labours about them, but *Profits* are as certaine (by the blessing of, God) as a harvest of Corne in Autumne when the husbandman hath plowed, and sowed, in the spring or other season.

Worceſterſhire, Herefordſhire, Gloceſterſhire, Kent, and many other parts in this Nation, can ſufficiently evidence the *Profits of Orchards and fruit-trees in the fields and hedges*, and thoſe good *Common-wealths-men*, who have written of the *Improvement of lands*, have all agreed, that this is the *higheſt way of improvement* of any other.

Mr. *Blith* in his Book intituled, The *Improver improved*, hath aſſerted, That *Planting Fruit-trees* at ſuch a diſtance as they cannot reach, when they have attained largeſt growth, they do advantage the Land, *even in reſpect of Graſſe*, (although the common prejudice againſt *Fruit-trees in fields* is, that they ſpoyle Graſſe) ſo that ſome Land not being worth above 10s, or 13s 4d. an *Acre*, the Graſſe (*by planting Fruit-trees* regularly upon it) was afterwards worth 30s, or 40s, or 50s an *Acre*. And the *Fruits* upon the Trees may yeild ſome 3l, ſome 5l. Or ſome 6 *or* 8l *an Acre*, *See Pag.* 262. of his Book.

And that in *Kent*, *Eſſex*, *Surrey*, *Middleſex*, and thoſe parts, ſome Land that was not worth above 6 or 8s the *Acre*, was by *Nurſeries of young Trees*, *planting and ordering of them*, in certaine years brough

brought to be worth 20l *an Acre*, and some 40 or more.

And further, he affirmeth, that some *Orchards* in those parts are worth to grase *Forty, or fifty shillings, an Acre*, and are so let to Tenants: And the *fruits* of those Trees seldome yeild so little, as *Double or treble the worth of the Grasse*, many times *five or sixfold*, or more, *see Pag.* 263. of his Book.

It may (perhaps) be objected: That Fruit-trees so planted make grasse (under, and about them) lower, that it is not so pleasant, and good for Cattle, as some other, where no Trees are.

It is Answered: Although it be not so pleasant altogether, as that where ther's no shade of trees, yet other advantages doe more then make amends. It's observ'd that *such Grasse is earlier in the spring* then upon other grounds, and that such grounds beare *more*, when it is cut for hay, or if pastured it keeps *more Cattle*, then Lands of like quantity not so planted: And besides, in a *hot and dry summer*, ther's grasse under, and about Trees, when its burnt up in other grounds.

My advice is therefore (all these *Profits and advantages* considered) that men set themselves diligently to this work of

Planting Fruit-trees, for improvement of their Lands and Eſtates. Not only, that they plant good *Orchards and Gardens*, but alſo that they *Plant round about their fields, and in the fields, and in their Corne, Paſture, & hay grounds*, (as in *Kent*) the fruit-trees at a large diſtance one from another, 20 or 30 yards aſunder, and that they ſuffer no branches to ſpread, within two yards from the ground, that ſo they may be out of the reach of Cattle & may not be troubleſome to workmen *in plowing, ſowing, reaping*, and other works.

If the Plants are faire ſtraight ones, of *two yards high*, or thereabouts, & fenced about to preſerve them from Cattle at the firſt, (with ſome ſtakes or the like) they will in a few years preſerve themſelves, and will need but little labour about them afterwards as long as they live,

And hereby men may reape *every yeare two harveſts*, (*from one and the ſame piece of land*) the one of *Corne*, the other of *fruits of trees*, and the latter (when trees are growne large) probably will be the greater.

And in this reſpect this way of *improvement of Lands*, is much better then other wayes

wayes of profit; becauſe in getting *Corne*, or raiſing profits by any other wayes of improvement, men muſt of neceſſity beſtow much *money, time, and paines* about them every yeare, which eats up a great part of their profits, but in *Planting fruit-trees*, the worſt is at firſt, after a few yeares they yield great profits, with little coſt and labour. So that as was ſaid *fruit-trees in a few years with ſmall coſt and labour; will double and treble the value of Lands*, and after many years, the advance of Profit will be *manyfold*.

But it may be *Objected*, That if all ſhould plant, then ſuch great profits could not be made, every man would have of his own. Ob.

I anſwer: that if all ſhould plant fruit-trees that may conveniently plant; yet would there be multitudes every where to buy for all that. For conſider, in a great *City or Town*, what a number of people there are, who have no Lands at all, not ſo much as a piece of ground belonging to their houſe, and many others but very ſmall quantities, theſe will be buyers of the husbandmans *fruits*, and the *Cider* and *Wines* that he makes of them. Anſ.

And let us ſay what we will or can, ther's many that have Lands which they

might Plant, and improve to an exceeding great value, who will yet be idle, and sloathfull, and object with Solomons sluggard *there's a Lyon in the way*, something or other that hinders: yet these men when they see fruits, will be as eager for them as any others, and therefore will be very good Chapmen to buy the Fruits of the diligent husbandman.

Objections *and* Discouragements *Concerning Planting*; *answered.*

BEfore I enter upon the work it selfe, it will be convenient in the first place, to Answer some maine Objections, to remove discouragements about this work of Planting Fruit-trees, that have kept off many from this profitable imployment, and may still hinder them, unlesse remov'd. And then I will give some encouragements to it from *Divine, and Humane Arguments and Testimonies.*

1. Ob. This is an Objection amongst many in the North parts: they say the Northern Countries are so cold, that Fruit-trees will not prosper nor beare fruits there.

Ans. To this I Answer: That although it be true that the *Northern Countries* lye in a more

more cold Climate then *Worcestershire*, *Herefordshire* and those Fruit Countries, yet I doubt not but that if they were as diligent in planting Fruit-trees in the North parts, as men are in these, they might have store of good fruits: so that some Cautions be observed *in the nature of Trees*. Its true: *Cold Countries* are not so fit for *choice and tender fruits*. as warmer Climates; but there are diverse kinds of *hardy fruits*, both Apples, Pears Cherries, which yearely experience shewes endure cold, and come to perfection in cold springs, when many other kinds are spoyled. Procure *Grafts*, or *Young trees* ready grafted of the best bearing kinds, such as are found by experience to beare well, even in cold springs. See pag. 53, 54, &c. Let such kinds therefore be sought for and Planted. Those good husbands in those parts, who are diligent in Planting Fruit-trees, have Fruits answerable.

2: Ob. Others say, that if they should plant Fruit-trees, and bestow much labour and cost about them, when they come to perfection and bearing fruits they should be robd of all, or most, and the Trees would be spoiled, and who would Plant to be so serv'd.

Ans. To this I Answer: That if there were

no remedy against this mischeife, it might indeed be a just discouragement: but this feare may be removed diverse waies.

And First: I advise, that having made a good fence about the Orchard, you keep therein a lusty Mastiffe or two; that will not be charmed in the night time, and the terrour of them will keep men from adventuring upon such an Occasion.

Secondly: some that have good Orchards watch their fruits. If a man keep 2, or 3, or more servants, they may watch in their turns, its no great matter, if you consider for what time only it is necessary, which is but from the time that fruits come to be worth getting, till they be ripe, and that's not long. And consider, it is in a pleasant season of the yeare, the paines and charge would be but little to the profit: we see men are vigilant & diligent much more then this would require upon far lesse advantages.

3. But there is a third means to keep Orchards from being rob'd, which I esteeme best of any other, it is this: I would have every man (that hath land) to plant some Fruit-trees for himselfe, that so they may not be theeves to their neighbours: and let those that have much fruit spare a part to them that have but little, or none of

of their own, and be no niggards but liberall to their neighbours: And this bounty will bring a double blessing, first from God, to increase the fruits; secondly from men, not to diminish them.

But I heartily wish that such as make but a sport of robbing an Orchard, would but consider the affliction and terrors of conscience that seised upon good *St. Austen*, for this very sin of robbing an Orchard, which he was guilty of before his Conversion: he confesseth it with much greife, and aggravates it with no lesse then ten circumstances, crying earnestly for mercy and pardon: *Ecce Cor meum Deus meus, ecce Cor meum, quod miseratus es in imo abyssi. &c.* When God lets loose the least sin to fight against a man, and but to shew it selfe in its proper shape, it will terrifie the stoutest heart: *A wounded spirit who can beare?* See the second Book of his Confessions. Chap. 4.

But there is another *Objection* greater then the former: Men usually say, should we plant Fruit-trees it would be so long ere they come to perfection, and bearing fruits, that our hopes would faint before we could see profit of our labours, perhaps they would not beare fruits of Sixteen, or Twenty yeares growth. 3. Ob.

I Answer first, that though the Objection Ans.

on were true, that trees Planted would be long ere they come to bearing fruit, perhaps 20 yeares or more, yet this should not discourage us; especially such as may have good hopes to enjoy the profits and pleasures of them many yeares after, and then leave them to their Children and to posterity after them. But secondly, men are generally mistaken upon this Accompt, Fruit trees rightly ordered, will not be so long ere they beare fruits as they suppose: I shall shew a way, that by Planting Fruit trees, and ordering of them as I give directions (by the blessing of a divine hand that still attends honest labours) we may receive *Profits* from them in halfe *Twenty yeares*, yea in *halfe that halfe*, yea in lesse then *five yeares*: sometimes the *third*, sometimes the *second* yeare, (of many kinds of fruit trees) after Grafting: Experience proves it, though we must know, the fruit cannot be much, while the trees are so small, in particulars; yet a multitude of such trees will afford a multitude of fruits: *A Cistern of water is but a multitude of drops.*

So then; that Fruit-trees may be planted and come to bearing fruits in 5, 4, or *3 years*, or sooner, the meanes is shew'd at large in the ensuing worke. So that I hope

his grand discouragement (which hath so long and so generally kept men from this profitable work) will be remov'd.

Now (as I promis'd) I will lay down some *Excitements, and Encouragements* to the worke of *Planting fruit-trees.*

Many large workes have been composed by Ancient Authors, for the Instruction of the husbandman in this his principall worke: And they have given this imployment many and great commendations and praises, and it is accounted by them the cheifest of all earthly imployments, because of the many *Profits and Pleasures*, that come by it.

And because it shall appeare what opinion and esteeme they have had of this course of life, and with what Praises they have set it forth, I will give you the particular expressions of some of them in their owne words; And then give the summe of what they have said to the plain husbandman, and others, that else could not understand them.

The praises of the Ancients and some late writers concerning the Husbandman's course of life in Planting Fruittrees.

Agricultura quid sit.

MIHI videtur nihil aliud esse Agricultura quam inspectâ Plantæ naturâ & Cœli & terræ ei idoneum cultum tribuere, & (ut ita dicam) cœlum cum terra maritare, vel societatem perquirere Cœli

Cœli & terræ ad Arbores: Sed quum Cœl
nullo modo queat flecti, oportet ut ſed
Agricola ſitus varietate utatur, ut C
facilè Plama aſſocietur. Agricolæ ad d
metas intendere debent, ad utilitatem, &
luptatem. Agricultura eſt Ars quæ do
uſuram cum terra facere. Inter omnia en
quæ utilitatem ſimul & jucunditatem p
unt, ut ambiguum ſit utilitatiſne an amœ
tatis plus habeat. Variis fructibus delect
non tempore uno ſed diverſis, alio renaſcen
alio decidente, ut unuſquiſque ex induſtriâ
cunditate te afficere ſatagat: Rami fructi
onerati pondere incurvantur, ac ſe in
decumbenti offerunt.

Aſpice curvatos Pomorum pondere ram
Ut ſua quod peperit vix ferat Arbor om

O quam dulciſſimum eſt fructus ex Arbor
bus quas ſeviſti, inſeruiſti, & coluiſti, p
priis manibus colligere, & Amicis, agnat
que jactabundus largiri. Eſt & alia
Arboribus delectatio, Avium ſcilicet mod
latio, ac ex variorum multitudine dulciſſi
us efficitur concentus: Aureſque canti
demulcent ſuis,

Aves canoros garrulæ fundunt ſonos:
Et ſemper Aures cantibus mulcent ſuis

Theophraſtus Hortum juxta ædes collo
vit, quem moriens teſtamento Philoſophan
bus reliquit: Democritus Abderites pr
hort

ortum Cellam habuit. Palemon Atheniensis hortis docebat. Laidis Cyrenei in hortis hola fuit, quos Attalus Rex ædificavit. Quid enim hoc opere innocentius vacantibus, quid plenius magnâ consideratione prudentibus; quid majus mirabiliùsque spectaculum est, quam cum positis seminibus, Plantatis surculis, translatis Arbusculis, insitis palleolis, tanquam interrogatur quæque (vis radicis & germinis) quid possit, quidve non possit, unde possit, unde non possit; cum rerum natura humana ratio quodammodo loqui potest, quid in ea valeat numerorum invisibilis interiorque potentia: quid extrinsecus adhibita diligentia, & in ipsa consideratione perspicere: quia neque qui plantat est aliquid, neque qui rigat, sed Deus qui dat incrementum. Mira est & inexplicabilis horti commoditas: nam si necessitatem considero, Agricultura tanto est humano generi emolumento; ut eâ carere nullo modo possis; si utilitatem, inter primas non postrema, aut unanam illi poterit comparari: si voluptatem dignitati commistam, ea est excellentia &c.

August.

Reges & Imperatores summosque magistratus non puduit Hortensia colere: propriis manibus.

Much more they speake in praise of his worke, which here (for brevity sake) shall omit.

Now that the husbandman (and every one) may understand what has been said by these Authors, and others, I will give more plainly the summe of all. They

They define husbandry to be an A
teaching men lawfull uſury with the ear
And that it ſeemes cheifly to be t
ſearching, and finding out the nature
Plants and Trees, and of the Heavens a
the Earth, and then to give unto Pla
fit place and ordering; according to t
nature of the Soyle and Climate; And (
they ſay) to marry and match togeth
Heaven, and Earth, or to procure a ſoc
ety, and neere fellowſhip between heav
and earth, for the increaſe and benefit
Trees and Plants: But ſeeing that th
heavens can by no meanes be bowed,
brought neerer to us, therefore it m
be the skill, and diligence of the hu
bandman to place and ſet his Trees in ſuc
ſort that the heavens may give their i
fluence and warmth, for encreaſe an
refreſhing of them. Husbandmen ough
to make Accompt of two harveſts yearl
the one of Profit the other of Pleaſure
for when a man hath done what is nece
ſary for his life, and thence proceeds *pro*
beſides all that, great Pleaſure ſprings fro
the Profit: and what greater pleaſure c
there be then that which is Accompanie
with Profit. Now of all eſtates of life d
husbandman may chiefly challenge this
himſelfe, yea it is qneſtionable whethe
th

he Profit or Pleaſure of his life be the greater: God when he would make the life of man Pleaſant unto him, he put him into an Orchard or Garden of delights, that he might labour therein with pleaſure of mind: There a man is delighted with variety of Fruits of Trees, not in one ſeaſon only, but in diverſe ſeaſons of the yeare, ſome young and ſpringing forth, while diverſe other kinds are ready to fall with ripeneſſe. So that a man doth even buſy himſelfe with the choice of ſuch varieties. The Boughs burthened with the weight of Fruits do bow to thee, and in a lowly manner offer their Fruits, as the Poet notes.

Behold the bending Boughs, with ſtore
of Fruits they teare.
And what they have brought forth,
(for weight) they ſcarce can beare.

Oh how ſweet and pleaſant is the fruit of thoſe Trees which a man hath Planted and ordered with his owne hand, to gather it, and largly and freely to beſtow and diſtribute it among his kindred and friends.

Yea it is a delight to heare the pleaſant tunes, and ſinging of Birds, which with their variety of notes, make a ſweet harmony and concent, and much pleaſe and allure

allure the ſence. *So the Poet,*

Melodious Ditties chirping Birds indite
whoſe pleaſant ſongs our raviſht eares invite.

Theophraſtus planted an Orchard clo[ſe] to his dwelling houſe, which when h[e] died, he left to ſtudents and lovers o[f] *Philoſophy*, and wiſdome. *Democritus* h[ad] his Chamber neer to a garden. Man[y] *Philoſophers* have taught their ſchollers i[n] *Orchards and Gardens.*

Auguſtine. What worke is more innocent the[n] *Planting of Fruit-trees*, and what more full of high ſpeculations to wiſe men the[n] it is: What is more wonderfull to behol[d] then (in ſowing ſeeds, in planting ſprig[s] in removing young Trees, in grafting new ſhoots or grafts) as it were to aske and demand with a mans ſelfe, what, by the nature and virtue of the Roots and Branches may be done, or what may not be done, for what reaſon it may be done, or not done (ſeeing the nature of things may after a ſort be declared by reaſon) what of many things is of force, and effect, by an invisible and inward power, and nature what diligence is outwardly to be uſed &c. In which conſideration and ſearch we may ſee and underſtand theſe things. Yet for all that, neither he that Plant[s] is any thing, nor he that waters, but God

God that gives the encreaſe.

They account this courſe of life free from many miſcheifes, and vexations, that neceſſarily attend other affaires: great and many cares, and troubles are found in honours, and high places, but this courſe of life about *Orchards and Gardens*, is full of ſweet reſt, honeſt buſineſſe, and modeſt pleaſures, which many famous & learned men have had recourſe unto for refreſhment after ſtudy, and other labours: It is full of honeſt profit and gaine, and brings and adminiſters all neceſſaries: here a man enjoyes pleaſant quietneſſe and tranquillity of mind, which is ſeldome attained by thoſe that follow *State Imployments*: This is worthy the exercise of wiſe men, of good men, of learned men, of Kings and Emperours: they have taken great delight in the ſtudy and practice of thoſe things: This courſe of life is far off from covetouſneſſe, & even tied and married to all Offices of love and friendſhip: This is a quiet & pleaſant life, worthy to be preferred before all honours & dignities: *This culture of the ground, and planting and ordering of Fruit-trees*, Occaſions ſearch and enquiry into many ſecrets profitable to men, which bring unto them ample ſatisfaction: yea the ex-

cellency and worthinesse of *Husbandry* is surpassing, it excells all other *Arts*, and appeares as the *Lady* or *Mistris*, they as *Servants* attending her. Many of the Ancients have largely declared unto us the nature and use of *Plants* and *Trees* before all other living creatures. The profit of a *Garden of Fruit-trees* is wonderfull, and cannot well be declared. And *Antiquity* can adde any nobleneſſe, and worth to a thing, what imployment then before this? what more ancient then the labour of the Husbandman. *Husbandmen* are called *Honeſt and good men*, becauſe of their innocent and juſt life. *Cicero* eſteemed it beſt of all other labours, nothing more rich and profitable, nothing more delightfull, nothing more worthy a generous ſpirit then it. In former times thoſe that were honoured & carried in triumph they were not honoured with *Gold*, *Pearles*, and other ſuch precious things, but with the *Boughs and Branches of Trees*. And in their Games and exerciſes, who ſo got the *Prize* were crowned *with the branches of certaine Trees*, as the *Olive*, *Palme*, &c. Such as got the *Conqueſt and Victory* of their enemies were crowned with the *Lawrell* which was to them a ſigne of *Victory*. And in their feaſts they gave

gave *Crowns and Garlands of Leaves, and Branches of Trees*, in token of mirth and pleasure. Besides, if this labour receive honour from the persons that have beene conversant in it, then it is *a Kingly Art*, and chiefest of all other. *Cyrus King of Persia* (who had all the Kingdomes of the earth given to him) was diligent, and most exact in the handling of it. He planted *Orchards and Gardens of Fruit-trees* with his owne hand, which when *Lysander* saw, he admired to see the excellent and singular order & disposition of them, saying, *O Cyrus*, right blessed shall all men call thee, because to thy dignity and Crowne thou hast joyned this care, and course of life. *See the worthie Acts of Cyrus king of Persia. Ezra 1. 1, 2, 3. &c.*

Tiberius tilled the ground and *planted Trees* among his subjects. *Elizeus Spartanus planted spacious and large Orchards*, and oftentimes therein to Feast and Banquet with his children and friends. *Kings, Emperors*, & highest powers were not ashamed to perform the workes belonging to an Orchard with their own hands. Divers *Emperours of Rome* had *Gardens of Fruit-trees*, and performed the workes therein with delight. *Diocletian Emperour of Rome* after he had reigned *twenty yeares*, betooke himselfe to a private life, and *Of this See, Sir Rich Barkley of the felicity of man pag 162.*

Planted Orchards and Gardens with his owne hand, wherein he took such delight, that he could not be intreated to take upon him again the *Government of the Empire: Solomon* (the wisest of all Kings) had *Orchards and Gardens of Fruit-trees*, took pleasure in them, and spake of all *Trees* from the *Cedar* even to the *Shrub*.

Mascall sets out this Art with admirable praises, he saies, among all sciences, and goodly exercises for men, there is none do more refresh the spirits, nor cause more admiration in the effects of Nature, or is more profitable for mans life then is the skill of *Planting and Grafting*. Many great *Lords and Noble Personages* have left their *Theaters* and goodly exercises, and have given themselves to *Planting and Grafting*, and such like imployments, and have commended nothing more then this imployment. The *Senators, Dictators*, and *Consuls of the Romans* have commended *Planting and Grafting* to be one of the flourishing labours in the world for the *Commonwealth*. Yea they did so much esteeme it, that they did hang *Tables* there of in divers places, never thinking the time more aptly spent, then in *Planting and Grafting*. Many worthy & learned men both ancient and of late dates, have written

ten for their Country and Commonwealth of the *fruitfull Art of Grafting and Planting.*

M. *Bolton* ſaies, *Vineyards, Orchards, Gardens*, and ſuch *inclaſed Plats*, are (as it were) the *Flowers, Starres, & Paradiſes* of the Earth.

And the Lord *Bacon* (in his *Eſſaies, pag.* 266.) ſaies, *Gardens are the pureſt of humane pleaſures, the greateſt refreſhments of the ſpirits of man, without which Buildings and Pallaces are but groſſe handy works.*

THus have I ſhewed (briefly) what ſome of the *Ancients*, and ſome late Writers have ſaid, and eſteemed of *Fruit-trees*, and of the *Husbandmans* courſe of life, and imployments about them.

I will now ſay ſomething more *of the dignity and value of Fruit-trees, and of the Art of Planting* from *Divine & Humane Arguments and Teſtimonies*, and after that I ſhall enter upon the work it ſelfe.

Though it be abſurd for a man to commend himſelfe, yet he may commend his *Calling and profeſſion*: *Paul* would not boaſt of himſelfe yet ſaith he, *Rom.* 11.13, *I magnifie mine Office*. Suffer me therefore (for *Encouragement* to all in the work,) to ſay ſomething in praiſe of

Fruit-trees, and of the employment about them, it being a worke so full of *Profit* and *Pleasure* in the life of man: The *workes of God are laudable, and have a dignity upon them*, and ought to be taken notice of, praised, and admired, not for themselves, but for the *Author*, that he through, & by them, may have the more praise *Psalm. 111. 3. His worke is worthy to be praised, and had in honour.*

Arguments of the dignity of Fruit-trees, *and Art of Planting.*

1 *Argument.* ONE *Divine Argument* of the dignity, and value of *Plants, Fruit-trees*, and the *Art of Planting* may be this.

It was Adams imployment in his innocency to keepe and order the Garden of Fruit-trees. Gen. 2. 15. *And the Lord God put him into the Garden of Eden to dresse it, and to keep it.*

God, who is wisdome it selfe, saw that a *Garden of Fruit-trees* was the meetest place upon all the Earth, for *Adam* to dwell in, even in his state of perfection. And therein allotted him *an imployment* for his greater delight, and pleasure: so that *this imployment*, as it is ancient, so it is honourable.

De Gen. ad Lit. Li. 8, *Augustin* is of opinion, that this *dressing*

of

of the Garden, was as well an exercise of the hand, as of the mind, not with toylesomenesse & trouble, but with delight and pleasure. *Non erat labor is afflictio, sed exhileratio voluntatis, quum ea quæ Deus creavevat, humani operis adjutorio, lætius, feraciusque provenirent, Creator ipse uberius ea laudaretur.* That things created in the Garden, by his labour, might be made more fruitfull, and God thereby have the more glory.

2 Argument.

The second *Divine Argument* is this.

Plants were the first animate bodies that God created: And fruits of Trees was the first food that was given to man, his food appointed by God, even in his perfect Condition.

And God said, behold I have given you every herb bearing seed, which is upon the face of all the Earth, & every Tree in which is the fruit of a Tree yeelding seed, to you it shall be for meat, Gen. 1. 29.

Another *Divine Argument* is from *examples* in Scripture of *Planting Fruit-trees*, & of the use of *Orchards and Gardens.*

3 Argument. Example. Diodat. exp Sir W. Rawley Hist. part. 1. Ch. 3.

First. God (blessed for ever) planted an *Orchard*, or *Garden of Fruit-trees*, Gen. 2. 8. *And the Lord God planted a Garden Eastward in Eden, and there he put the man whom he had formed.*

Aug. de Civit Dei lib. 13. c. 24.

God planted a Fruit-garden. That is, *He caused a parcell of ground to bring forth Plants and Trees most exquisite and usefull for man, and enriched that place with more fruit-fulnesse and beauty, then any other part of the Earth, and called it* EDEN, *that is, a place of Pleasures.*

Sir W. Raw. l. 1. Book, 1. part. Chap. 9.

And at this day, this *Region of Eden* (afterwards called *Mesopotamia*) is exceeding fruitfull, being in the best *Climate 35 degrees from the Equinoctiall, and 55. from the North-pole*, in which *Climate* the most excellent *fruits, Oyles, Grains, &c.* are found.

2 *Example.*

Secondly, we have for our example herein that good, & holy man, who found grace in the sight of God, when all the world (save a few with him) perisht, *Gen. 9. 20. And Noah began to bee an husbandman, and he planted a Vineyard.* Or as some conceive, he began to *prune and dresse the plants* that were set before the Flood, and to order them that they might yeeld their fruits.

Example.

Thirdly, We have for our example herein the friend of God, faithful Abraham, *Gen 21. 33. And Abraham planted a Grove in Beersheba, and called there on the name of the Lord, the everlasting God.*

Of the fitnesse of these shades by *Arbours,*

Arbours, Seats, and close walks in Orchards for contemplation, and private exercises, I shall speak hereafter.

Fourthly, King *Uzziah* delighted in his imployment, 2 Chro. 26. 10. *Uzziah had husbandmen and dressers of Vines in the Mountaines and in Carmell, for he loved husbandry.* 4 Example.

This King raigned a long time in *Jerusalem over Juda*, fifty and two yeares. 5 Example.

Fifthly, King *Solomon*, a great and wise King, *Eccl.* 2. 4. tooke pleasure herein, and though we may not follow him in any immoderation, and excesse, yet there is a lawfull, and warrantable use of these delights) Vers. 4. 5. *I made me great workes, I builded me houses, I planted me Vineyards, I made me gardens, and Orchards, and I planted in them Trees of all kind of fruits.* 6 Example.

Sixthly, For the use of an *Orchard* and *Garden*, we have the *example* of the Mirror of Chastity, Virtuous *Susanna*. It was her custome to walke in a *garden*, as we see in the *History* vers. 7. 8. *Susanna went into her husbands garden to walke, the two Elders saw her going in every day, and walking.* 7 Example.

Seventhly, The people of *Israel* (by a speciall command from God) made use of

Arbours

Arbours and shady places, in their gre[illegible] Feasts: *Nehem.* 8. 14. 15. *It was publish[illegible] and proclaimed in all their cities, and [illegible] Jerusalem, saying, Goe forth unto the Mo[illegible] and fetch Olive Branches, & Pine Branche[illegible] and Mirtle Branches, and Branches [illegible] thick Trees, to make Boothes: So they ma[illegible] these Boothes upon the Roofs of their hous[illegible] and in their Courts, and in the court of t[illegible] house of God, and in the streets; and th[illegible] sate under these Boothes, and there was ve[illegible] great gladnesse.*

8 *Example.* Eightly, For the use of an *Orchard*, [illegible] *Garden*, we have the example of our bl[illegible] fed *Saviour* whose custome it was to w[illegible] in a *Garden*, *Joh.* 18. 1. *when Jesus h[illegible] spoken these words he went over the Bro[illegible] Cedron, where was a Garden, into which [illegible] entred with his Disciples: We see he oft[illegible] came to this Garden, for Judas observed [illegible] was his custome to goe to it. v. 2. Judas kn[illegible] the place, for Jesus often times resorted th[illegible] ther with his Disciples.*

4 *Argument.* Hos. 12. 10. *I have used Similitudes by the Ministry of the Prophets.* Another *Divine Argument of the Di[illegible] nity and value of Fruit-trees, and art [illegible] Planting*, is from the frequent use of *Si[illegible] litudes* betweene the Church of God a[illegible] Fruit-trees, and betweene our Savio[illegible] and Fruit-trees.

Fruit-trees beare the figure and resem[illegible] blan[illegible]

blance of many high and great *Mysteries* held forth to us in *Parables*, *Tropes*, and *Allegories*, which represent *Morall*, and *Spirituall things*, under the shape and figure of these *Corporeall things*.

One *Similitude* is betweene the *Church* and a *Vineyard*. *Esay.* 5. 1, 2, *My beloved hath a Vineyard in a very fruitfull Hill, verse* 2. *And he fenced it, and gathered out the stones thereof, and planted it with the choyce Vine, &c. And he looked that it should bring forth grapes &c.* 1 *Similitude*

Secondly, the *Prophet David* useth the *Similitude* of a fruitfull tree to expresse the Condition of a Godly man. *Psal.* 1. 3. *He shall be like a Tree planted by the Rivers of Waters, that bringeth forth his fruit in his season, his Leafe also shall not wither, and looke whatsoever he doth it shall prosper.* So *Jeremie*, *Jer.* 17. 8. *He shall be as a Tree planted by the waters, and that spreadeth out her Roots by the River, and shall not see when Heate commeth, but her Leafe shall be greene, and shall not be carefull in the yeare of Drought, neither shall cease from yeelding fruit.* 2 *Similitude*

Another *Similitude* our Saviour useth to expresse the Condition of his Church drawne from the *Vine*: *Jo.* 15. 1. *I am the true Vine and my Father is the husbandman:* 3 *Similitude*

every

every branch in me that beareth not fruit h
taketh away, and every branch that beareth
fruit he purgeth it, that it may bring forth
more fruit. As the Branch cannot beare fruit
of it selfe, except it abide in the Vine, n
more can yee except yee abide in me, Verf. 4.

4 Similitude

Another *Similitude* is betweene *Natur*
all and *Mysticall* Grafting, Rom. 11. 17.
Concerning the calling of the *Gentiles* an
rejection of the *Jewes* for a time. If som
of the Branches be broken off, and thou being
a wild Olive tree wert grafted in among
them, & with them partakest of the root and
fatnesse of the Olive tree, Ver. 23. And they
also, if they abide not still in unbeliefe, shall b
grafted in, for God is able to graft them in
againe, Verf. 24. For if thou wert cut out of
the Olive tree, which is wild by nature, and
wert grafted (contrary to nature) into a
good Olive tree, how much more shall these
which bee the naturall branches, be grafted
into their owne Olive tree?

5 Similitude

Fiftly, The condition of the *Church* i
figuratively, & by Allegories described by
Solomon in his *Songs*, *Chap.* 4. 12, 13. An
amongst other figures and resemblances
there us'd, one is taken from an *Orchard*
or *Garden* of *Fruit-trees*. *A garden inclosed*
is my sister, my spouse. Thy Plants are an or
chard of Pomegranates, with pleasant fruits

Likewise

Likewise Cant: 2: 3: *like the Apple-tree among the trees of the wood, so is my beloved among the sonnes; I Sate downe under his shadow with great delight, & his fruit was sweet to my taste.*

6 *Similitude*

Sixtly, A Fruit-tree beares the figure and resemb'ance of our *Saviour Christ* in the description of *Spirituall Paradise* Revel. 22. 2. *In the midst of the street of it, and of either side of the River was there the tree of life, which bare twelve manner of fruits, and yeelded her fruits every month, & the Leaves of the Tree were for the healing of the Nations.* And againe Chap. 2. 7. *To him that overcommeth I will give to eat of the tree of life, which is in the midst of the Paradise of God.*

Concerning *Similitudes* between *Materiall* and *Mysticall Fruit-trees*, see the *Observations* following in the second part.

5 *Argument.*

Another *Divine Argument* may be this.

God hath threatned to withhold his blessing in these things, if we do not obey him, and hath in displeasure often deprived men of the same for their *disobedience*, which proves them to be of *value* and *worth*: For when God is displeased with a people, or particular persons, and will shew it by some correction, that he may bring them to repentance, he doth it not

by

by withholding, or taking from them some small matters, that they can easily spare without griefe or trouble, for that would worke no effect, but by withholding or depriving them of something that's precious, and deare to them, the want or losse of which, will fall the heart: which course God hath observed with people, concerning these particular blessings. As appeares

1. This was part of two of the ten Plagues wherewith Egypt was punished, Exod. 9. 25. *The haile brake every tree of the field.* And as the Prophet David hath it, Psalme 78. 48. *He destroyed their Vines with haile, and their Mulberry trees with frost.* & Psalme 105. 33. *He smote their Vines also, and Fig trees:* and Ex. 10. 5. *Locusts did eat all the trees which the haile had left.*

2. Secondly, among the *signes of Gods displeasure against Israel* this is one, Amos 4. 9. *I have smitten your Fruit-trees, &c. yet have you not returned unto me, saith the Lord.*

3. Thirdly, the Prophet calls to mourning, Joel. 1. 12. For, *The Vine is dried up, the Fig-tree languisheth, the Pomegranate tree, the Palme tree also, and the Apple-tree, even all the trees of the field are withered, because joy is withered from among the sons of men.*

4. Fourth-

4. Fourthly: God in displeasure for sin
selle them, Deut. 28. 39. 40. *Thou shalt*
plant Vineyards and dresse them, but shalt
neither drinke of the wine, nor gather the
grapes, for the wormes shall eat them. Thou
shalt have Olive trees throughout all thy
coasts, but shalt not anoint thy selfe with Oyle,
for thine Olive shall cast her fruits. And God
bids Moses tell the people, if they would
not obey, *their land should not yeild their*
increase, neither should the trees of the land
yeild their fruits. The like againe, Zeph. 1.
13. Amos 5. 11. Esay, 17, 10. Hosea 2. 12.

Another *Divine Argument* may be this: 6
God hath promised these things as blessings Argument;
to such as obey him, and from time to time
performed it: Not to be lookt upon as
things of light, and triviall consequence,
but to be considered as strong engage-
ments to obedience. When God hath
seems well pleased with a Nation, or
particular persons he hath often shewed it
among other tokens of his love) *by mul-*
tiplying the fruits of their trees, encouraging
them to *plant Fruit-gardens*, and promising
his blessing thereon. As we see.

1. God (by his Prophet) encourages
his people in *Babylon* to build, & to plant,
Jer. 29. 5. *Build ye houses, & dwell in them,*
and plant gardens and eat fruits of them.

2. And

2. And in the promise of their return this was one of the blessings God would bestow on them, Amos. 9. 14. *And I will bring againe the captivitie of my people Israell, and they shall build the waste cities and inhabite them, & they shall plant Vineyards, and drink the wine thereof, they shall also make gardens and eat the fruit of them.*

3. Thirdly, When they came into Canaan that pleasant land, this is mentioned as one of the blessings, Neh. 9. 25. *They possessed houses full of all goods, wells digged, Vineyards and Oliveyards, and fruit-trees in abundance.*

4. And among the showers of blessing (as the Prophet calls them) this is one, Ezek: 34. 27. *The tree of the field shall yeeld her fruit.* And Ezek: 36. 29. *I will multiply the fruit of the Tree.* The like of many other places, Mal. 3. 10 11. Joel. 2. 21. 22. Levit: 26. 3, 4. Esay 65. 21, 22. Levit. 19. 23. &c.

And thus much of the first *Divine Argument from the promises of God, and performance of them, in these things* to his people.

7 *Argument.* Another *Divine Argument of the Dignitie and value of Fruit-trees, and the art of planting*, is from *two generall commandements given by the Apostle Paul*, which though they mention not these things in explicite

an

and plaine tearmes, yet they are commended to us *by plaine and cleare implication, and deduction:* for as out of *generall promiſes* we may draw, and deduct particulars, & make applications from them; ſo alſo from *generall commands and directions.*

The firſt *Command* is that of *Paul* in his Epiſtle to *Titus* Chap. 3. *v.* 14. *Let ours alſo learne to maintaine good works for neceſſary uſes, that they be not unfruitfull:* here's a generall *Command,* out of which one particular may be derived for the preſent purpoſe. The Apoſtle here, by *Good workes,* meanes good works as they are towards the maintenance of the *Commonwealth, or a particular Family* with neceſſary commodities and uſefull things, as *Honeſt Trades, and Imployments,* as the Margint renders it.

Now it is clear, *this work & imployment of Planting Fruit-trees, is a good worke for neceſſary uſes,* ſeeing the life of man may by it be maintained with ſo many neceſſaries belonging to it: See *Profits of an Orchard,* p.

This being ſo, the *Apoſtle* (then) bids us *learne to do it,* as if he ſhould ſay, get ſome skill in it, and be doing then *uphold and maintaine it.*

The ſecond *generall Command* is that which the *Apoſtle* writes to the *Philippians,*

pians, Chap. 4. 8. *Whatsoever things are True: whatsoever things are Honest: whatsoever things are Just: whatsoever things are Pure: whatsoever things are Lovely: whatsoever things are of Good Report: if there be any Virtue, if there be any Praise, thinke on these things.*

Now it is easy for a man to speake of many particular *Imployments*, which have upon them the *Characters and Marks* here mentioned: but of them all, I know not one (except Divine Imployments) that hath these *Marks* so clearely stampt upon it, as this *Imployment* of the husbandman in *Planting Fruit-trees*. *This Imployment* answers exactly to the *Apostles Rule*, as it were face answering face in the glasse: for what particular labour is more *honest*, more *just*, more *pure*, more *lovely*, of better *report*? what hath more *Virtue*? what hath more *Praise* then it? see what hath been said in the *Praise and good report* of it, and the rest of the *Properties*, at large, already mentioned, *pag.* 11, 12, 13, 14. *&c.*

Now this being so, then we ought to follow the *Apostles Command*: If there be any *Virtue*, if there be any *Praise* (saith he) *think on these things*. The words are very Emphaticall: *whatsoever*, *and if there be any praise*. His meaning is, whatsoever

the work be, though mean in the eye of the world, yet, if there be but any one of these *Characters and Marks* upon it, it is worthy to be followed, then how much more when it has them *All*, and that so eminently, as that every eye sees them. *Thinke on these things*, saith he, first to search out what *works and imployments* are markt with these *Characters*: and then, *think on such* to like, chuse them, to set about them, to follow them, & make such things our professions *for the praise of God, and profit of men.*

And so much for the seaventh *Divine Argument.*

8 *Argum:*

Another *Divine Argument*, is from *Gods command for the preservation of fruit-trees:* He layes a speciall charge upon men for their *safety and preservation*, as we see, Deut. 20.19.20. *When thou shalt besiege a city a long time in making war against it, to take it, thou shalt not destroy the trees thereof, by forcing an Axe against them, for thou mayest eat of them, and thou shalt not cut them downe, to further thee in the siege, for the tree of the field is mans life*, Vers: 20. *Only the trees which thou knowest that they be not trees for meat, thou shalt destroy, and cut them downe, and thou shalt build Bulwarks against the city that maketh war with thee*

untill it be subdued. Although this Scripture may be taken in an *Allegoricall sence*, as signifying to us Gods care *of Mysticall Fruit-trees*, his people: *being Trees of righteousnesse of the Lords planting*: yet the same may also be taken *in a litterall sence*, & as some Godly men conceive, is a positive binding Law even at this day.

We see God ingeminates, and repeats his charge to preserve the *Fruit-trees, being trees for food, and nourishment of mans life*, they must not be destroyed, though it were on so great an occasion as to further the siege against their enemies. He leaves *other trees, such as are not trees for meat, such as beare no fruits*, to be cut down and destroyed, as they have use for them in the war, but they must not spoyle, nor meddle with the *Fruit trees*.

I have discovered these *Divine Arguments of the dignity and value of Fruit-trees and the art of Planting*, to stir up and encourage men to so good a work, to a work of so great and many advantages to the Commonweale.

1. *Humane Argument.* And because *Humane Arguments*, are likewise prevalent which men observe them also for further encouragement.

The first *Humane Argument of the dignity and value of Fruittrees, and the art of Planti-*

Planting is from *Presidents*, or *Examples* of wise and learned men, of great and good men in former ages, who have practised this Art.

Examples either in *Vertue* or *Vice*, are powerfull with men, (especially *Examples of great ones*.)

Brevius iter per exempla, quàm per præcepta

Its much easier to prevaile with people by *Examples*, then by *Precepts* or *Rules*. And if *Examples* of great ones, even in things evill, are so powerfull, as they are with most men, how much more then should they be prevalent *in honest, and vertuous things*: so that herein is a double inducement, the *Example*, and the *Vertue*: here is a twofold Argument concurrent and met in this imployment of *planting fruit-trees*: *Presidents*, and those of the highest; *Philosophers, Kings, & Emperours*. Secondly, *Vertue*, and that of the chiefest Nature that secular Imployments have in them.

So then observe some *Examples* recorded by antient Authors *in this imployment of planting Fruit-trees*.

Plures excellentis doctrinæ viri, & Philosophandi studio, &c. *Pog. Floren.*

Many famous and learned men (saith he) *studious in Philosophy, have delighted in this*

course of life, and found therein abundance of pleasure, and contentment.

Si dignitas Agriculturæ accedit ei iis qui eam tractaverint, Regalis Ars & dignissima erit. If the dignity and esteeme of this *Art* may be drawne from those who have beene conversant in it, then it is a Kingly Art, and chiefest of all others.

Reges & Imperatores summosque Magistratus. &c.

Cyrus King of *Persia*.
Philometrus, *Heronus*, *Archelaus*, *Attalus* } King of *Asia*.
Evax and *Avicen*: Kings of *Arabia*.
Solomon King of Israel
Telaphanus.
Antonius Pius.
Elizeus.
Numa.
Sportanus,
Alcinous,
Mithridates the great.
Alexander the great.
Diocletian, Emperour of *Rome*,
And many others.

Kings, Princes, Roman Emperours and the highest powers on earth, have not disdained to performe the works of an Orchard with their owne hands, and taken delight therein.

Mascall *saies*: Many great Lords and Noble personages, *have* left their Theaters, goodly exercises, and *have* given themselves to Planting and Grafting, & *have* accounted nothing of higher commendation.

The

The second *humane Argument of the dignity and value of Fruit-trees, and the art of planting, is from the praises of ancient and late Writers, and the suffrage, or general consent of all people.* 2. *Humane Argument.*

Works and imployments that have the *praise* but of some persons only, we cannot conclude the worth and dignity thereof from such praise, because selfe and sinister ends may sway in the minds of such: but those imployments that have the *praise of all*, and where there is a concurrence, & consent of minds *in all people in the praise thereof*, (of the *Good*, as well as the *bad*, of the *Learned* as well as the *unlearned* of the *Wise*, as well as the *unwise*) these probably are good and vertuous.

Now this *art and imployment of planting Fruit-trees*, hath the joynt & unanimous consent, not onely of *greatest persons of the world*, but likewise of *all persons in the world*, there's none hath ill will towards it, none hath any thing to say against it, *but all without exception, give it their good word and speake in the praise of it.*

If men doe but speake of it, they'l commend it, and say, *its a goodly imployment, its both a pleasant and profitable worke, its good for a Commonwealth, it enriches whole Countries*, to this purpose men usually speake

speake of it: what ancient and late writers have said in the praise of it, may be seen, pag. 14, 15, 16. *&c.*

And for the second *Humane Argument* thus much.

3. *Humane Argument.*

The third *Humane Argument of the dignity and value of Fruit-trees and the art of planting is, Argumentum ab utili,* from the *Profits* that are receiv'd thereby.

Let us see then what *Profits* may be had from an *Orchard or Garden of Fruit trees.*

Profits arise from an *Orchard* many waies: one way is to mans *Estate:* and that in two respects: first, *in respect of house keeping,* and provision for his family all the yeare.

1: *In house Keeping.*

Secondly *in respect of sale,*

Such as have good Orchards know by experience that they are very profitable for meat, and drink, all the yeare long, many good dishes they make of Fruits, & many wholsome & pleasant drinks, *Sider, perry, Cherry-Wines, &c.* Which are not barely nourishing but have other special properties, they moderately coole and refresh the spirits in heate of *Sommer;* and besides they keep the body from grosse and superfluous humours, & carry downe the seed of diseases, which else would lodg and grow in the body, and at length

sprin

ſpring out to the prejudice of health.

Of the healthfullneſſe of thee *Liquors*, See the uſe of Fruits. *pag.* 100, *&c.*

Secondly, *Fruit trees are profitable to the Husbandman in reſpect of ſale of the fruits*, when a man has more then he can ſpend in his houſe; eſpecially to ſuch as live neare ſome great *Towne* or *City*, where they have vent at pleaſure. The *poet* ſaw the *profits of an Orchard*, when he ſaid. 2. *For Sale.*

Non illi deerat, quod pauperis exigit uſus,
Interdum locuples a paupere multa petebat.
The Orchard doth with fruit the poore ſupply
With which he doth the wealthie gratify,

The *Profits of an Orchard* once come to good perfection(doth exceed the profits of Corne (upon like quantity of ground) many times over. As hath been computed and ſet downe by thoſe that (I ſuppoſe) well knew the value of both. And touching *Profits to the Eſtate* thus much.

Secondly, *An Orchard or garden of Fruit-trees* (and Imployments about the ſame) *is profitable to the body, firſt in reſpect of health: ſecondly in reſpect of long life.* 2. *Profitable to the body.*

What is a greater earthly bleſſing then *perfect health of body*? ſome have ſaid *valetudo* 1. *In reſpect of Health.*

tudo eſt ſummum bonum: Health is the chie-
eſt earthly good thing: what will not me-
doe for *health*, they will ſet body an-
mind and all on work for *health*: they wi-
part with *friends*, *houſe and lands*, *ſilve-
and gold*, and all for *health*.

Now *health* is preſerved: firſt, *by mode-
rate and ſeaſonable exerciſe*, in the *Orchar-*
the labour that preſerves health muſt no-
be too violent, it muſt be but *ad ruboren-
non ad ſudorem*, as ſome adviſe: to brin-
the body to a temperate and gentle hea-
not to immoderate ſweating.

Hiſt. Life and Death. p. 412. & 169. The *Lord Bacon* adviſeth to exerciſe
cauſing rather *perſpiration then ſweating*
and ſaies further, that an idle life doth
manifeſtly make the fleſh ſoft and diſſipa-
ble, but robuſt exerciſe, (ſo it be with-
out overmuch ſweating, and wearineſſe)
maketh it hard and compact, which ad-
vanceth health.

Secondly, *Health* is preſerved *by freſh
and wholſome Ayres*, which in heat of ſom-
mer is found in *Arbours*, *Seats*, *and Walks in
the garden of Fruit-trees*. The aforeſaid
Author tells us the *ayre* in ſommer is pre-
datory and hurtfull through the heat of
the ſun, and therefore ought (as much as
may be) to be excluded from the body.
Now there is no *freſh wholſome ayres*, *and*
coole

cool shades to be found any where in ſummer ſeaſon, better then theſe *in the Orchard, or garden of Fruit-trees* ſo the Poet.

Opaca prebent arbores umbracula,
Prohibentq; denſis fervidum ſolem comis.

Green Canopies the ſhady trees us lend
Gainſt ſcorching ſun, boughs thick, whilſt they extend.

Thirdly, *Health* is preſerved, *by pleaſant and wholſome Odours, and perfumes found in the Garden of Fruit-trees*, all the *ſpring* & *ſummer*, by *digging the Earth*, & from the *Leaves* and *bloſſomes of Trees*:

Lo: Ba: tells us, the vapours of freſh earth by digging, condenſe and refreſh the ſpirits. *Hiſt. Life and Death p. 207. & 208.*

And that *Leaves of trees falling* towards *the middle of Autumne, yeild a good refreſhing to the ſpirits*

But the moſt *pleaſant and wholſome Odours*, are from the *bloſſomes* of all the *Fruit-trees*, which having in them a condenſing and cooling property are therefore, not ſimply *Healthfull*, but are accounted *Cordiall*; chearing and refreſhing the heart and vitall ſpirits.

Now the *ſpirits* (as this *Author* obſerves) are the *Maſtermorkmen* in the body, and as the *uppermoſt Wheele* which turneth about the other wheeles in the body; and

therefore

therefore whatsoever is Healthfull and r
freshing to the spirits, works (powerfull
good effects in the body: And that spee
ly & suddenly: as the Author sales, *Vapo
and Affections worke compendiously upon t
spirits.*

Hist. Life, and Death, p. 236.

Of the *Healthfulness of Odours* see mo
at Large, in the title *Pleasure of the sens
smelling in a Garden.*

Fourthly: *Health* is preserved by *wh
some meats and drinks* all the yeare fro
the *Garden of Fruit-trees.*

The spirits of the body in sommer st
in need of cooling and condensing, a
what meats and drinks more proper
that purpose then *dishes and drinks of
fruits an Orchard.* They are both *Al
mentall* and *Physicall*: they *cure disease
and preserve health*: discharging the bo
of the beginning, and seeds of many d
seases.

2. In respect of long life.

Secondly: *A Garden of Fruit-tree
profitable to the body* in respect of *Lo
life.*

How much have men valued *long li*
in all ages of the world, what strang
courses have some taken to extend the
life to a great length; some have liv'd
Caves and Rocks, and sequestred them
selves from society with men, and bet
ke

ven themselves to a strict Monasticall course, that they might stretch out their life, and be said to live.

Yea amongst *Christians* who though they desire to be dissolved and to be with Christ. Yet in some respects *long life* is to be accounted a blessing, and is set before us as an encouragement to obedience: as we see Deut. 32. 47. *The feare of the Lord is your life, & through this ye shall prolong your daies.* And Prov. 3. 1, 2. *My sonne keep my Commandments for length of daies, and long life shall they add to thee:* the like in many other places. Now I say: An *Orchard or Garden of Fruit-trees is profitable to the body for Long life*: and that in severall respects.

Deu. 32. 47
Prov. 10. 27
Prov. 9. 11.
Ps. 91. 16.

All these four last mentioned means for *Health*, the same likewise conduce and are *profitable to long life*: wherein lies another part of their excellency and worth: for as the *Lord Bacon* observes: some things are profitable for an *healthfull*, but are not good for *long life*, but all these conduce as well to *long life*, as to *health*: so that *Moderate exercise*. 2. *Fresh Ayres*. 3. *Pleasant Odours*. 4. *Wholsome meats and drinks*, (which are all had in an *Orchard or Garden of Fruit-trees, are* (also) *all profitable to long life*.

Hist. L D, pag. 179, & 180.

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Hist. L. D. pag. 183. & 414. The foresaid Author saies: *The spirits are the master workmen of all the effects in the body, and therefore in the intention of long life ought to be first placed.*

So then: whatsoever worketh upon the spirits for their refreshing and vigour is *profitable to long life.*

Hist. L. D. pag. 235. The operation upon the spirits, and their waxing fresh and vigorous, is the most ready and compendious way to *Long life.* Now an *Orchard or Garden of Fruit trees, and imployments therein,* work upon the spirits for their refreshing two waies.

First by the *Organs of the Body.*

Secondly by the *Affections of the mind.*

Touching the first, viz. *The operation upon the spirits through the Organs of the body, set at large in the pleasure of the five Senses.* pag. 48, 49, &c.

Concerning the operation upon the spirits by the *Affections of the mind,* I shall here speak and mention only *three Affections* of the mind which work powerfully upon the spirits, conducing to *long life.*

1. *Affection Hope.* One *Affection of the Mind* which works effectually upon the spirits for *Long life* is *Hope.*

Hist. L. D. pag. 224. The *Lord Bacon* saies, *Hope* is most beneficiall of all the *Affections and doth much to the prolongation of life, if it be not too often*

often frustrated, but entertaineth the fancy with an expectation of good: therefore (saith he) *they which fix and propound to themselves something as the marke and scope of their life, and continually, and by degrees go forward in the same, are for the most part long liv'd; & Hope is as a Leasejoy which must be beaten out to a great extension, like gold.*

Now the diligent Husbandman in this art of *Planting Fruit-trees*, has good and sure grounds for *Hope*, not only from many *Promises in the word*, but likewise subordinate grounds from *Reason and Experience*. This *Hope* is sown with the seeds of his fruits, and springs up with them, and so from yeare to yeare his *Hope* grows and increaseth with his *Fruit-trees*. He lies before him, and considers what great *Profits and Pleasures* are comming towards him; he sees by experience what a plentifull harvest of *Profits and pleasures* others receive from *Orchards or Gardens of Fruit-trees*, which are as *fuel*, or *food* to nourish and feed *Hope*, and hold it in strength and vigour; and when he begins to receive *Profits and Pleasures* from his *Fruit-trees*, these refresh *Hope*, and make it grow from strength to strength with his Fruit-trees: and thus from yeare to yeare

Hope

Hope is continued and increased, and
this while the spirits are refreshed,
Hope is refreshed and are kept thereby
gorous and strong, and in a pleased tem
per and condition, and being the *Mast*
workmen in the body, or *first wheele* (
the Author saies) they work upon all th
parts of the body, for *Prolongation*
life.

And so much concerning the *operati*
upon the spirits by Hope.

2. *Affection, Joy.* Another *Affection* of the mind which
this imployment works upon the spiri
for *long-life, is joy*.

Hist. L. D. pag. 221. The foresaid Author saies: That th
Affection of Joy works so powerfully on
spirits, that some great Joyes comming su
denly, and unexpectedly, do over much att
nuate, and diffuse the spirits. But no
theres no danger of the suddennes of *Jo*
in these things, whereby to raise and ove
much diffuse the spirits; for such things
cause *Joy* in the imployment of *plantin*
Fruit-trees, are *expected, and waited fo*
and Hope prepares the way for Joy. *Joy* is
cleare, shining, beautifull *affection*, and r
ses some degrees higher then *Hope*: *Jo*
in the use of earthly things is lawfull in
season; theres *a time to rejoyce*, as well
a time to mourne: And there is a lawfu
jo

joy in harveſt in gathering in the fruits of the Earth, *Eſay* 9. 3. It is commanded and allowed of God, *Deut.* 12. 16. *Thou ſhalt rejoyce before the Lord thy God in all that thou putteſt thine hand unto.* And againe, *Deut.* 16. 15. *Becauſe the Lord thy God ſhall bleſſe thee in all thy increaſe, and in all the works of thine hands therefore thou ſhalt ſurely rejoyce.* A Chriſtian may *rejoyce* in the Lord in the uſe of earthly bleſſings. And in this Imployment of *Planting Fruit-trees* there are many grounds and occaſions of *rejoycing*: The *joy* of the Husbandman is not a flaſh and ſo away, but it is a *ſetled and habituall joy*, and is renewed from time to time: which is the very thing the aforeſaid Author ſpeaks of in giving inſtructions concerning *Long life. This life* (ſaies he) (*as much as may be*) *is ſo to be ordered that it may have many renovations, and the ſpirit by continuall converſing in the ſame actions may not wax dull.* And againe *One thing above all is gratefull to the ſpirits, that there be a continuall progreſs to the more benigne: and no doubt* (ſaith he) *it furthereth* Long life, *to have all things from our youth to our elder age mend, and grow to the better.* *Hiſt. L. D.* p. 228. p. 232. p. 164.

Now this imployment of *Planting Fruit-*

trees is above all humane acts, most suitable to these *Rules* whereby this *Affection of joy* is kept fresh and vigorous which also keeps the spirits cheerful and lively: for herein *are many renovations, and a continual progresse to the more benigne, and things mending and growing to the better.* *Joy* is continually renewed from year to year, yea, in divers seasons of the yeare there are fresh and new *joys*.

In the *spring* of the year *joy* springs fresh in beholding the *seeds and young grafts and plants* spring forth vigorously and strongly. And the *buds and blossomes* breathing forth pretious and pleasant *Odours, rejoyce and delight* the inward and outward senses, promising a plentifull Harvest *of fruits in Autumne*; and all the Sommer long *joy* is cherished, with *cool fresh ayres, singing of Birds, sight of abundance of Fruits*, burd'ning all the Trees, delighting the Eye with the beautifull formes and colours; and in *Autumne joy* is renewed againe with a rich and plentifull Harvest of Fruits; and all the Winter long *joy* is nourished and fed with a free use of all the *Fruits, Wines, and Delicates* made of them. So here's a succession of *joys*, one following on the neck of another, whereby

the *spirits* are still kept in a cheerfull temper and condition, and work powerfully on the *grosser parts* of the body, conducing to *Long-life*.

Concerning the lawfulness of rejoycing in earthly blessings, with a Caution: See afterwards.

Another *Affection of the Mind* which (in this imployment) works powerfully upon the spirits for *Long life*, is *Admiration*. 3. *Affection, Admiration.*

The *Lord Bacon* saies: *Admiration and light Contemplation, are very powerfull to the Prolongation of life.* This *affection* ascends a step higher then the other two, for as *joy* rises higher then *Hope*, so *Admiration* higher then *joy*. *Hist. L. D. pag.* 225.

It is our duty to *Admire* God in his works, which is a step higher then simply to praise him. When we look upon the works of a skilfull Artificer, and commend it, it is for his credit; but when we admire and wonder at it, this is a higher commendation. The Holy Prophet would have us search out and wonder at the the works of God, Ps. 111, 2. *The works of the Lord are great, sought out of all them that have pleasure therein.* Vers. 3. *His work is honourable and glorious:* and he calls us to this duty of *Admiration*, *O come hither and behold the works of God*

how wonderful he is in his doings! Ps. 111. 4. He hath so done his *Marveilous works*, that *they ought to be had in remembrance.*

Now in this *Imployment of planting Fruit-trees*, are many things to be seen, and understood to cause *admiration*, which works effectually upon the spirits for *long life*.

Lib. de Cult. & Insitione. Ch. 17.

Baptist: Port: speaking of the *wonderful effects of Grafting*, says, it is an *admirable Art*, and the chiefest part of the husbandman's work.

Artem insitionis admirabilem esse ac totius Agriculturæ nobilissimam partem, voluptuosam, utilem, &c. When he considers the strange effects of Grafting, he falls a wondering, *O mira insitionis potestas! &c.* And *Mizaldus* speaking of *grafting*, says, *Insitionis ope artificiosâ, multa ad stuporem usque miranda fieri*, many things may be done even to *admiration*.

Austin wonders at these things. *Quid majus mirabiliusq; spectaculum est, quàm compositis seminibus, plantatis surculis, &c? In exiguo grano mirabilior, præstantiorque vis est &c. What more strange things are to be seen in Nature, then to be sowing seeds, setting and grafting young plants, and such like works? In a small seed there is a wonderful and admirable power and vertue.*

Ma

Many *strange things* may be found in this imployment.

Will it not cause *Admiration*, to consider that a huge and mighty body, (the biggest of all bodies whatsoever that have life) doth arise of a small *kernel or seed*, that that *seed* should contain in it (*vertually or potentially*) a great *Tree*, with all the properties of it, and retain its nature exactly in every particular? 1

Will it not cause *Admiration*, to see goodly, wholesome, and beautiful fruits, come forth of rough and crooked Trees? especially to observe the manner of their coming forth, the care that Nature takes to secure and preserve the seed of the Fruit, by covering it with the *Buds*, *Blossomes*, *Skin* and *Substance* of the Fruits, with the *Core*, *Stones*, or *Shells*, and also with the *leaves of the Trees*. 2

Will it not cause *Admiration*, to consider that the nature and properties of a great Tree, are inclosed, and lye in every small twig, yea, in every bud of the Tree, even in the least *Bud*, yea, in the *Root* of that least *Bud*, (in some no bigger then a pins point) which *Bud* being set on a small plant (according to Art) will grow to a Tree, in all respects like to that whence it was taken? 3

4. Will it not cause *Admiration* to consider how many severall substances are made of *one simple substance?* for of the *Sap* of Trees is made the *Bark*, *Wood*, *Pith*, *Leaves*, *Buds*, *Blossomes*, *Stalks*, *Fruit* and *Seed*.

5. Will it not cause *Admiration* to consider that *Grafts* and *Buds* set upon *Wild stocks* (such as naturally bring forth sower, harsh and noughty fruits) that though the *Grafts and Buds* be nourished by that *harsh and different sap*, and receive all their substance and growth from it, that yet these *Grafts*, and *Buds* should retaine their own natures, and not be altered into the nature of the Stock whereon they grow, but have power to digest, change, and assimilate this harsh and sower sap, into their own sweet and pleasant natures, and bring forth fruits accordingly?

6. Will it not cause *Admiration* to see little small Plants of but two years old (and some but of one year, if grafted) to hang full of fruits and to be able to beare them forth to their naturall bignesse and goodnesse, and notwithstanding to make a large and sufficient growth the same yeare?

7. Will it not cause *Admiration* to see the busie

buſie and induſtrious *Bees* to gather *Hony*, even from the flowers, or bloſſomes of *bitter Almond-trees*, and other Flowers and Plants, that to our ſenſe are bitter and unpleaſant?

Will it not cauſe *Admiration* to ſee very many, and very great fruits hang upon *onely* one *ſmall and ſlender twig*? A great *Author* notes it for a ſtrange thing, that all the nouriſhment which produceth (ſomtimes) ſuch great fruits, ſhould be forced to paſs through ſo narrow necks, as the *ſtalk of the Fruit*. 8 *L. B. Hiſt. L. D. pag.* 85.

But may it not be accounted a more *ſtrange thing*, to ſee five or ſix, or more, fair and large fruits, to hang upon a ſlender twig, little bigger then the ſtalke of each particular fruit growing on it!

Will it not cauſe *Admiration* to ſee one Tree hang full of *different and ſeveral kinds of fruits*, as an *Apple-tree* with all, or many kinds of *Apples*, or a *Cherry-tree*, with all, or many kinds of *Cherries*? So of other kinds of trees: to ſee one tree hang full of fruits, different in their *Forms*, *Colours*, *Leaves* and *bloſſomes*, which may be done by *Grafting*, or *Inoculating* ſo many ſeveral kinds of *Buds*, or *Grafts* upon one tree. 9

Will it not cauſe *Admiration* to ſtand 10

upon a Mount in the midst of a fair large Orchard in the spring time, and to behold round about a multitude of several sorts of Fruit-trees, full of beautiful *Blossomes*, different in their *shapes* and *colours*, ravishing the sense with their sweet *Odours*, and within a while, turned into faire and goodly fruits of divers *Colours and Kinds*; the Fruit-trees gorgeously arrayed with green leaves, and various colour'd fruits, as with so many precious *Jewels & Pearls*.

And thus much touching the operation upon the spirits in order to *Long-life*, by these three *affections*, *Hope*, *Joy*, *Admiration*.

3. *Profitable to the mind.*

Thirdly, This *imployment of planting Fruit-trees, is profitable to the mind.* First in respect of *Knowledge*. Secondly, in respect of *Meditations*.

1. *In knowledge.*

This work is profitable to the *Mind*, by storing it with variety of *objects*, and *profitable notions*, both *natural*, *moral*, and *spiritual*.

How variously does Nature discover itself in *Planting*, *Grafting*, *Budding*, *Blossoming*, *and bearing Fruits*. So that such as are studious in the search of the *secrets of Nature*, may observe the process and course thereof in manifold respects about these things.

And multitudes of *Experiments* may be drawn out for *use* and *profit*. If men will but

but joyn *Contemplation* and *Action*, *Study* and *Practise* together, they ſhall find (even in this one Volumn or Book of the Orchard) many uſeful and fruitful *Leſſons*, for temporal and ſpiritual advantage.

And as the imployment is *profitable to the mind* in reſpect of *knowledge*: ſo alſo in reſpect of *Meditation*, by occaſion whereof the *affections* of the ſoul may (with the help of the ſpirit) be raiſed, and turned into a ſpiritual temper. 2. *In Meditation.*

How fitly does the *Garden of Fruit-trees* offer unto us that moſt profitable and fruitful *Meditation of our firſt fall, and original ſin*, whereof we were all guilty, *in ſuch a place*; even *in an Orchard or Garden of Fruit-trees*: in which Meditation our *affections* ſhould work to lay our ſelves low in our own eyes, to abhor our ſelves: and to exalt God, and abundantly to joy in the infinite and boundleſs mercy of God in Chriſt, in that he took pity on poor Man when he was fallen, and paſſed by the Angels when they were fallen, (*Creatures* by creation more excellent then *Man*) and left them in an irrecoverable ſtate of miſery. But in the ſame place, even as ſoon as we had ſinned, promiſed us a Saviour, and

and when the *fulness* of time was come, sent him into the *world*. In consideration of these things, our *Affection of Love to, joy in, and Admiration of God*, should be inlarged and boundless. O the *height* and *depth* of the *Mercy and Justice of God*, towards the *Angels Justice*, but towards us *Mercy*. What can we render unto the Lord for this his infinite mercy? Now seeing he looks for nothing but *Love and Praise*, let us begin it here, that we may hold on to all eternity.

4. *Profitable to the name.*

Fourthly, *Planting Fruit-trees, is profitable to the name* of the Planter. Fruit-trees are *living, lasting monuments*, and bear up and *perpetuate* the *Name* of him that *Planted* and *laboured* about them, both while he lives, and in generations after. A late Author * says, that *Apple-trees* and *Pear-trees* (and some other kinds of Fruit-trees) on good Land, and duly ordered, will last 800 or 900 years.

* Lawson: *a Planter of forty or fifty years experience; in his Book, pag. 47.*

What earthly thing is better then a *good Name? Solomon* tells us, *Eccl. 7. 1. A good name is better then precious ointment*: And again, *Prov. 22. 1. A good name is to be chosen before great riches, and loving favour above silver, and above gold.* One says, *The best temper of minds desire a good name, and the lighter popularity and applause.*

L. B. *Nat. Hist. pag. 258.*

A good name is not onely to be desired

but

but to be highly prized, and to be reckoned the chief of earthly blessings, not only for the *beauty of it*, but for the *permanency of it*, it abides when *friends, riches, life and all is lost*. Now one way to gain and keep a *good name*, is by *gifts* and *benefits*: The worst temper of minds are won, and held by *gifts* and *good turns*: it's natural to all creatures, to love those that do them good; and who can *so easily* give *so great, so many*, and *so acceptable gifts*, as the husbandman, that yearly nurseth up multitudes of *fruit-trees*, and hath store of *pleasant fruits, wines*, and *delicates* made of them? While he lives, he bestows young *fruit-trees, fruits*, and many acceptable gifts out of his *Orchard*, and being dead, his *Orchards, Gardens*, and *Fruit-trees*, live & flourish, and occasion a *remembrance* of his *Name* for many *ages after him*.

And secondly, as *gifts and good turnes*, gaine a *good name*, so also to be conversant and imployed about works for the *Publick and generall profit of a Commonweal*: such works produce the same effect.

We know all labours and imployments, that bring both *Profit* and *Pleasure*, are approved & praised of all, though the advantage be but to a *private family*, how *much* more when they are for a *Commonweal*? And besides this *Moral consideration*, God hath

hath promiſed the great bleſſing of a *good name* to them that are converſant in good imployments, *Rom.* 13.3. *Do that which is good, and thou ſhalt have praiſe of the ſame.* Rom 2. 10. *Glory, honour, and peace, to every one that worketh good, upon the Jew firſt and alſo on the Gentile.*

So then, the work of *Planting fruit-trees* is *profitable to the name* of the Husbandman, both while he lives, and in Generations after him.

5 *Profitable to others.*

Fifthly, An *Orchard or Garden of Fruit trees*, and the employment about them is *profitable to others*: Firſt, in the preſent times; Secondly, in the time to come.

This *profit to others*, is by beſtowing our fruits on friends and neighbours, and ſuch as want. For though God require not to himſelf (as formerly) *the firſt of all the fruits of all trees, year by year*, Nehem. 10.35. Yet God requires year by year, when he beſtowes all upon us, that we ſhould give a part to himſelf again; that is, to his poor members that want them.

This is the way to obtain a bleſſing upon all our labours. *Deut.* 15.10. *Thou ſhalt ſurely give unto him (that is, unto thy poor Brother) & thine heart ſhall not be grieved when thou giveſt unto him, becauſe that for this thing, the Lord thy God ſhall bleſs thee in all*

thy works, and in all thou putteſt thy hand unto.

A Gift to the Poor is a gainful gift, for by it a man becomes *Creditor* to his *Creator*, Prov. 19. 17. *He that giveth to the poor, lendeth to the Lord, and the Lord will recompence him.* Eccleſ. 35. 11. *The Lord recompenceth, & will give thee ſeven times as much.*

Likewiſe, the fruits of an Orchard are *profitable to others* that buy them: the *Buyer* having good and profitable Commodities for his money, has profit thereby as well as the *Seller*.

Yea, this labour *is profitable to others* in time to come, *Qui ſerunt Arbores, alteri ſeculo proſunt.* After ages receive much profit alſo: When our ſelves and others have received our full portion of profit, then Fruit-trees are left to children, and poſterity to receive Profit many *Generations* after.

And thus much touching the *Third humane Argument*, from the *Profits* that are received from a *Garden of Fruit-trees*.

The *fourth humane Argument of the dignity and value of Fruit-trees and the Art of Planting*, is, *Argumentum a voluptate*, from the *Pleaſures* that are receiv'd thereby. *Pleaſure* is called, *ſal & condimentum vitæ*. The ſalt that ſeaſons all things to us. In all

4. *Humane Argument.*

all that a man hath *pleasure* in, it is that which makes it acceptable. *Pleasure* (as one says) is the *good* of every thing, and a pattern of Heaven.

Now, we find *pleasure* in an *Orchard* or *Garden of Fruit-trees*, suitable to all the *Senses* of the body. And here's a mixture of *pleasures with profits*: for divers objects of the senses, are both *pleasant and profitable*: this imployment is richly furnish'd with both.

And as I have shew'd some particulars wherein *profit* consists, so likewise I will shew some particulars wherein *pleasure* consists, in the use of a *Garden of Fruit-trees*.

Each *sense* hath its particular *pleasure*.

First for the *sense of hearing*.

1. *Pleasure of the sense of hearing.*

It is a *pleasure to the Ear to hear the sweet notes and tunes* of singing Birds, whose company a man shall be sure to have in an *Orchard*, which is more pleasant there, then elsewhere; because of other concurrent *pleasures* there: a *Consort of Musick* is more pleasant then upon a single *Instrument*. The Poet took notice of this *pleasure*.

Aves Canoros guttura fundunt sonos,
Et sonipedi Aves cantibus mulcent suis.

Melodious throtles, chirping Birds incite,
Whose pleasant songs, our ravisht ears invite

And

And besides, something more this sense may receive from an *Orchard* (though it have least share of pleasure therein of any of the *senses*) by *hearing* the slow motion of *Boughs and Leaves*, by soft and gentle Airs, sometimes (as it were) with a kind of singing or whistling noise, which will easily induce a sweet and pleasant sleep in summer time (if a man be dispos'd) in some close cool Arbour, or shady seat.

Secondly, the sense of *Touch* may have *Pleasure* in an Orchard from the cool fruits and leaves of Trees, smoothing and brushing the face therewith, which is refreshing and cooling in heat of Summer. But this *sense* receives *Pleasure*, chiefly by the *shade of trees* in summer time. Cool refreshing Ayres are found in close *Walks*, *Seats*, and *Arbours* under and about the Trees, which keep off the burning heat of the Sun. 2. *Pleasure of the sense of Touch.*

Opaca prebent arbores umbracula, prohibentque densis fervidum, solem comis,

Green Canopies the shady Trees us lend
Gainst scorching sun, boughs thick whilst they extend.

Yea, they do not simply keep off the heat of the Sun, but likewise much cool the Ayre by its contact of these cool *bodies*,

Trees,

Trees, Fruits, and *Leaves*; coole fre
aires in heat of ſommer are ſou
for, and are not onely pleaſant, b
exceeding profitable, and healthful t
the body. Here *Profit* and *Pleaſure* me
and imbrace each other. And hete
agrees the L. *Bacon*, who ſays, *Excluſion*
aire is profitable to long life; for aire is pre
datory to long life through the heat of the ſu
and ought (as much as is poſſible) to be ex
cluded from the body. Now, what bette
place is there, to exclude the heat of th
Sun from the body in ſommer ſeaſon, the
amongſt the *ſhady trees, Arbours and W*
in the Orchard?

Hiſt. L. D. pag. 241.

It's laid for a ground, *That condenſ*
the ſpirits in their ſubſtance is avaiſable
long life, which (he tells us) is done moſt
fectually by cool aires. Refrigeration, or c
ing of the body from without, is above
things neceſſary to long-life.

L. B. Hiſt. L.D. p. Ca. 11. Pag. 425.

So then, the *pleaſure this ſenſe* receiv
from a Garden of Fruit-trees, is to be muc
eſteem'd.

Thirdly, *The ſenſe of ſight*, partakes
Pleaſure in an Orchard, in beholding t
exact *Order* in Planting of the Trees, the
decent forms, the well compoſed *Allie*
Walks, Seats, and *Arbours* therein: for O
der and curious forms of things, much

3. Pleaſure of the ſight. Nat. Hiſt. p. 225.

light the sight: of this, see L. Bacon at large.

Likewise, *the sight* is delighted with pleasant and delicate *Colours of the Leaves, Blossomes, and Fruits*, that shew themselves in great variety, *curious Colours*, especially the *Colour green*, is accounted helpful to the sight.

Fons, Speculum, Gramen, Oculis sunt alleviamen:

Green grass, clear grass, and fountaines pure
Refresh Eye-sight, long to endure.

Here again *Profit* and *Pleasure* meet.

And as foul and odious objects presented to the *sight*, cause dislike in the spirits, that they retire and shun such objects, so *contrario verum*, the contrary holds in *delightful and pleasant* objects of the sight, the spirits thereby are delighted. He says, *Objects of the sight, as comming into a faire Garden, or into a fair Room richly furnished, and the like, do delight and exhilerate the spirits much.* The beautiful flowers of various colours, amongst the lovely Blooms of Trees and Plants, what a glorious shew will they make.

See L. B. Nat. Hist. pag. 199.

Nat. Hist. p. 224.

Flores nitescunt, discolore gramine,
Pinguntque terras gemmeis honoribus.

Gay flowers woven with discoloured grass,
With rich imbroidered Robes the earth compass.

Is it not a *pleasant sight* to behold a multitude of Trees round about: in *decent form and order*, bespangled, and gorgeously apparelled with *green Leaves, Blooms and goodly Fruits*, as with a rich Robe of imbroidered work, or as hanging with some pretious and costly Jewels or Pearls; the Boughs laden and burdened, bowing down to you, and freely offering their rip fruits, as a large satisfaction of all your labours?

Aspice curvatos pomorum pondere ramos,
Ovid. *Ut sua, quod peperit, vix ferat Arbor onus.*
The laden boughs, with weight of Apples, crack;
And Trees to bear their burthens strength do lack.

4. *Pleasure of the smell.* *Hist. L.D. p 207. p. 208.*

Fourthly, the *sense of smell*, may likewise have its share of *pleasure* in a Garden of Fruit-trees. *L. Bacon* says, *The sm of new and pure earth, excellently refresh the spirits*; he says, *A certain great Lo who lived long, had every morning, imm diately after sleep, a clod of fresh earth la*

und

under his nose, that he might take the smell thereof: and again, *Good earth, newly turned up, hath a freshness and good scent.* And that the *leaves and branches of some Trees, are odorous and sweet.* He says likewise, *That the leaves of Trees falling towards the middle of the Autumn, yield a good refreshing to the spirits.* And that *the Moss of some apple-trees hath an excellent scent, and is used of Perfumers.* *Nat. Hist. Cent. 9. p. 210.* *Nat. hist. Cent. 6. p. 136.*

But chiefly, The *pleasure this sense meets with, is from the sweet smelling blossoms* of all the fruit-trees, which from the time of their breaking forth, till their fall, breath out a most precious and pleasant odour; perfuming the Aire throughout all the Orchard.

The same Author observes, *That the most Delicate Smells*, are from those Plants whose Leaves smell not, and amongst other things, he mentions *Blooms of Apple-trees.* *Nat. hist. Cent. 4. p. 102.*

And in another of his *Experiments*, he says, *That generally those smells are most grateful and pleasant, where the degree of heat is small: for those things do rather woo the sense then satiate it. And prefers cool smells before hot, for comforting of the heart.* *Nat. hist. Cent. 9. p. 210. Hist. L. D. pag. 295.*

Now, The *Blooms of Apple-trees, Pear-*

tree, *Cherry*-tree, and such like, have small degrees of heat, and therefore the *Odour* is *pleasant and wholsome*.

And besides the *pleasure* of this perfumed Aire, it is also very profitable, and healthful to the body. Here again *Profit* and *Pleasure* meet together and imbrace. An *Odores nutriant*, is a question amongst Philosophers; some hold sweet perfumes nourishing, doubtless they give a great refreshing to the spirits, and whatsoever delights and cheers the spirits is without controversie very advantagious to the health of the body; for the spirits are the chief workers in the body, from which proceed all, or most of the effects wrought in the body, good or bad, according to the temper of the spirits.

Sweet Perfumes work immediately upon the spirits for their refreshing, but *meat and drink*, by ambages and length of time; sweet and healthful Aires are special preservatives to health, and therefore much to be prised.

If the Curative part of Physick be worthy and excellent, as the preservative part: Its better to stand fast, then to fall and rise again.

Now, a *sweet perfumed, fresh, wholsome Aire* (which is chiefly found in *Gardens*

of *Fruit-trees*) is greatly available to that purpose, as well as *pleasant to the sense*.

Fifthly, The *Sense of Taste* hath its pleasure in an *Orchard*. This *sense* meets with *pleasure* at all times of the year, from the fruits of an Orchard. The *pleasure* of the other *senses* are to be had but at some seasons of the year onely. This *sense* hath *pleasure* from all sorts of ripe, and raw fruits, besides meats and drinks, and many dishes made of them. The ordinary food they afford all the year, and the more delicate for Banquets, are also good and healthful to the body, as well as *pleasant* to the taste. Here again, *pleasure and profit* meet and imbrace, so the Poet: 5 *Pleasure of the Taste.*

Hortus salubres præbet corpori cibos,
Oblectat Hortus, invocat, pascit, tenet.
The garden to the body, gives sound and healthful meats,
The garden pleases most, draws, holds, and feeds with delicates.

In the heat of Sommer, what place is fitter for the table, then some *sweet, shady, cool Arbour in the Garden?* And what meats better befitting that time of the year, then some *dainty dishes made of the cool fruits*

of the Orchard? At which time cooling and refreshing the spirits from within and with out by cool Aires, and cool meats, is most advantagious for health and long life: for these are the chief means (at that season) to keep the spirits in a fine, pleasant, equall temper; yea some fruits have higher vertues ascribed to them then barely to nourish, some *Apples* are accounted *Cordials*: *Avicen* sayes, *That both the tart and pleasant Apples, strengthen the heart, and to such as are troubled with that infirmities, they are a singular help. Confortant Cor, propter odoriferum, dulcia, & acetosa, &c.*

Lib. 6. cap. 569.

L. Bacon reckons *Pear-mains* among cool *Cordials*.

Hist. L. D. pag. 398.

So then, when fruits are not onely healthful, but also pleasant to the taste, there is a double worth in them.

Consider now what hath been said for the *Pleasure of the Senses*; And if it be so acceptable to have the *pleasure*, though but of one *Sense*, what will it be when there is a concurrence and meeting of all together, which may be had in a *Garden of Fruit-trees*? so the Poet.

Non

Non deſit Hortis, & voluptas maxima,
Multiſq; commixta modis jucunditas:
Tribuit volenti multiforme gaudium.

There wants not in Gardens great
pleaſure to the mind,
And outward ſenſes many mixt plea-
ſures find,
They yield unto the Artiſt joyes of
divers kind.

We ſee what a plentiful and joyful Har- *Profits.*
veſt of *Profits* and *Pleaſures* may be yearly
reaped from an Orchard or Garden of
Fruit-trees.

Here's *Profit* of divers kinds.

Firſt to a mans *Eſtate*: and that in two
reſpects. First, *in reſpect of houſekeeping,* 1.
with meats and drinks all the year.

Secondly, *in reſpect of Sale,* either *the*
fruits in their kinds, or *Cider, Perry,* and
Wines, made of them.

Secondly, Here's *Profit* to *the body,* and
that in two reſpects. *Firſt, in reſpect of*
Health, by moderate exerciſe, freſh Aires,
pleaſant Odours, and wholſome meats and
drinks.

Secondly, *in reſpect of Long-life, by ope-* 2.
ration upon the ſpirits, through the Organs
of the body, the Ears, Touch, Smell, Sight,

Taste, and through the Affections of the mind, Hope, Joy, Admiration.

3 Thirdly, Here's *profit to the Mind.* And that *in two respects*; First, *in respect of knowledge, Natural, Moral, Spiritual*; Secondly, *in respect of Affections.*

4 Fourthly, Here's *profit to the Name*, and that *in two respects*; First, *in this life, by Gifts and Benefits*; Secondly, *after death, by Fruit-trees as living Monuments.*

5 Here's *Profit to others*, and that *in two respects*, First, *to the Poor, and the Rich Friends, or Enemies, in the present times*; Secondly, *to posterity or future ages.*

Pleasures. Here's likewise *Pleasures* of divers kinds.

1. First to the *Ear, and that in two respects*; First, *by sweet tunes of Singing-birds*; Secondly, *by gentle motion of Borghes, and Leaues.*

2. Secondly, Here's *Pleasure to the Touch*, and that *in two respects*; First, *by cool fruits, boughs and leaves*, Secondly, *by cool fresh Aires.*

3. Thirdly, Here's *Pleasure to the Eye*, and that *in two respects*; First, *by exact and decent forms of Trees, Alleys, Walks, Seats, and Arbours*; Secondly, *by curious colours of the blossomes, leaves, and fruits.*

4. Fourthly, Here's *Pleasure to the smell*, and

and that *in two respects*; First, *from fresh Earth digged up*; Secondly, *from the leaves and Blossoms*.

Fifthly, Here's *Pleasure to the Taste*, and that *in two respects*; First, *from ripe and raw fruits*: Secondly, *from dishes and drinks made of them*. 5.

Some employments, as they are *profitable* in one respect, yet they are *unprofitable* in another: yea, perhaps are full of hazard and danger, either to the *state*, *body*, *mind*, or *name*; but this imployment preserves, and is profitable to all these. Some imployments are pleasant to one sense, but not to another, perhaps unpleasant, and hurtful; but in this there's an Agreement and consent of *Pleasures to all the senses*.

And as there is a mutual consent and concurrence of all the *profits* among themselves, and of all the *pleasures* among themselves, so likewise there is a mutual consent and concatenation of the *Profits*, with the *Pleasures*, one imbracing another, one supporting and upholding each other.

Five ways of Profit, each of them in two respects,

And five ways of Pleasure, each of them in two respects.

Here's

Here's *Profit* and *Pleasure* running along hand in hand, meetly matched together, being the most rich and beautiful *King* and *Queen* in all the world.

Thus having shew'd the great *Praises* that are given to this Art of Planting Fruit-trees, and some *Divine* and *Humane Arguments* of the dignity and value thereof, and likewise the profits and pleasures that are received from an Orchard or Garden of Fruit-trees, I think it meet to give a caution *concerning* temporal *profits & pleasures*.

A Caution in the use of Earthly things.

It's true; We have liberty to seek earthly *Profits* and *Pleasures* in our Callings, and to rejoyce in them, but yet with care and circumspection, and with due regard to circumstances.

There is a Rejoycing in Earthly blessings which God allows to us, Deut. 26. 11. *Thou shalt rejoyce in every good thing which the Lord thy God hath given thee.* And Deut. 12. 16. *Thou shalt rejoyce before the Lord thy God in all that thou puttest thine hand unto*: And again, Deut. 16. 15. *Because the Lord thy God shall blesse thee in all thy increase, and in all the works of thine hands, therefore thou shalt surely rejoyce.* And when our ways please God, he saith, *Go, eat thy bread with joy, and drink thy wine with a merry heart.* Eccles. 9. 7. Solomon

Eccles. 5. 18. *Behold, that which I have seen, it is good and comely for one to eat and to drink, and to enjoy the good of all his labour he takes under the sun, all the dayes of his life, which God giveth him, for it is his portion:* And Chap. 2. 24. *This I saw, That it was from the hand of God.*

No doubt we may use these and other earthly blessings with Rejoycing: but all the danger is, lest we take too much liberty herein, and break beyond our bounds.

These *Profits* and *Pleasures* being multiplied in the Garden of Fruit-trees, we had need beware of reaching after them too greedily. *Latet Anguis in Herba*, A subtle Serpent lies hid among these pleasant flowers, and seeks to bite us by his temptations, who has as much (or more) malice and policy now, as formerly against our first Parents, whom he deceived *in a Garden of Fruit-trees.*

Men may become *Idolaters* ere they be aware, and so are many, even among Christians, in worshipping *profit* and *pleasure*; setting up these two for their house-hold Gods. The Prophet tells us, Ezek. 14. 3. *They set up their Idols in their hearts, and put that to them, which is due onely to God.*

We may easily mistake between the use of

*The difference between using and enjoying a thing.

of earthly blessings, and the enjoyment of them.

De Doctrinâ Christi. l. 1. *Austin* tells us, no earthly blessings are properly to be Enjoy'd, but used onely. *Res aliæ sunt, quibus fruendum est, aliæ quibus utendum; illæ quibus fruendum est, beatos nos faciunt, istis quibus utendum est, tendentes ad beatitudinem adjuvamur, & quasi adminiculamur, ut ad illas, quæ nos beatos faciunt, proveniamus. There are some things (saith he) which are to be enjoyed; others to be used; those which we ought to enjoy, make us happy, such as we ought to use onely, and those whereby we are furthered, and are as succors, aids, and helps, to bring us to those things which may be enjoyed, & make us happy.*

He tells us, whom, and what we may enjoy, *Fruendum est Patre, & Filio, & Spiritu Sancto. Beatum est ad tale bonum provenisse, quo amplius non potest. The Father, the Son, and blessed Spirit, are to be enjoyed. And its true blessedness to attain to that good which is the highest.*

So then, God only is to be *enjoyed*, and the good things of this life only to be *used* as *helps* and *furtherances* unto God. We have need therefore take heed of falling in love with earthly things: The foresaid Author tells us the danger of it. *Si eis quibus utendum est frui voluerimus, impeditur vursus*

De Doct. Christ. l. 1.

[illegible]ster, & aliquando etiam deflectitur, ut ab [illegible] rebus, quibus fruendum est, obtinendis vel [illegible]ardemur, vel etiam revocemur, inferiore a[illegible] praepediti: Et si amœnitates itineris, [illegible] ipsa gestatio vehiculorum nos delectarent, [illegible] ad fruendum his quibus uti debui[illegible] nollemus citò viam finire, & perver[illegible] suavitate implicati alienaremur à Patria, [illegible] suavitas faceret beatos. That is, if we fall to enjoying of such things as we ought but onely to use, we are thereby hindered in our course, and many times even turn'd out of it. And as to the obtaining of those things which we ought to enjoy (by the love of earthly things) we are call'd back from them, and much retarded, and stopt in our way to them. And if the *Pleasures* and *Contentments* of the journey and the carriage, by which we are conveyed, over-much please and delight us, then we turn to enjoying of those things which we ought but only to use, and therefore are unwilling to come to our journys end, and are intangled in corrupt delights, and brought thereby to be estranged from the Country, the *sweetness* and *pleasure* whereof, maketh blessed.

We see then, when God gives us blessings largely, and gives us leave to use them freely, we are in danger to forget him:

We

We had need therefore to set a watch, o guard upon our hearts, lest *profit* and *pleasure* steal it, and keep it to themselves. But what a shame is it we should have fewer thoughts of God, when he is most mindful of us. And that we should fall so much in love with the *Token*, that we forget him that sent it.

And now, having answered the doubts and discouragements that have hindered some from entring upon this part of the Husbandmans work, The *Art of Planting Fruit-trees*; and shew'd the great esteem that all men have of it, and the value and dignity thereof from *Divine and Human Arguments*, what a rich confluence of *profits* and *pleasures*, are (from time to time) brought unto us by it, with a *Caution* in the use of these things.

What remains, but that I also discover how we may obtain our desires herein by what means the work may be done, with *most speed, and best effect? Which I shall now endeavour to do.*

Of the Nursery.

I shall first speak of a *Nursery of young Plants*, and shew the manner of sowing of *Kernels*, or *Seeds of Fruits*, and their prepa-

preparation and ordering (by *Grafting* and *Inoculating*) for transplanting into *Orchards*, *Gardens*, or *Fields*: (although some may plant an Orchard a more speedy way, to buy young trees ready grafted, or to plant stocks of divers years growth, and after they have grown a year or two to graft them.)

I shall set down all these things as briefly as I can, so that withal, I make them plain to the intelligent Reader, laying down the most material, and essential things concerning this Art: For long and tedious discourses (about things that may be comprehended in few words, (as many are) they do often mislead men, so as it is not easie to see the most material things concerning their subject, or what they drive at; whereas, a brief and plain discovery of them may better be comprehended and remembred.

1. First then: Let there be a plot of ground (more or less) digged up about the time when Fruits are ripe, and let all the *Grass*, *Weeds*, *Roots*, *Stones*, *&c.* be clean picked out, and the ground cast into Beds about a yard broad, and spaces between, about a foot in breadth, to part between them, to *Sow*, *Set*, *Weed*, *&c.* And then procure *Kernels of Apples*, *Pears*, *Crabs*, Cherry-

Cherry ſtones, * Plum-ſtones, and the ſeeds of divers kinds of Fruits, and they may be ſet, and ſowed, from the time the Fruits are ripe, until the ſpring (except in froſt) in this manner.

* But as for Aprecott-ſtones it is beſt to keep them (in ſand) till October, before we ſet them; becauſe if they be ſet early, when the fruit is ripe, they commonly ſpring up before Winter, and then being very tender, the froſt kills them: ſome Peach-ſtones, and other Plum-ſtones, will lie in the ground, until the ſpring come Twelvemonth, and then come up: therefore conclude not that it will never ſpring up, though not the firſt year.

Having made the Beds level with a Rake, ſprinkle the ſeeds upon them all over, each kind by themſelves, and ſet, or ſow the ſtones by themſelves, then take a ſpade, and turne in the ſeeds and ſtones about a handful deep or leſs, and after rake them all over, and (that none may be left uncovered) caſt ſome ſmall mould with a *Sieve*, or beſprinkle it with a ſpade all over them, and ſo let them reſt all Winter.

Preſerve ſeeds from Mice.

And carefully obſerve that *Mice* devour not the *ſeeds in Winter*, if you perceive it ſet *Traps*, and lay *Rats-bane* to deſtroy them. Though you cannot ſee the *Mice*, yet if they have been there (as commonly they are) it may be perceived by divers ſmall holes up and down the ſeed-beds where they have devoured the ſeeds, and ſome huſks will lie above ground.

In the *Spring* and *Sommer*, let them be weeded, from time to time, clean, and if the weather be dry, let them be watered now and then, and they will make a growth the same year, according to the strength and goodnesse of the ground wherein they grow. Plants comming of seeds or stones, are far better then *Suckers* from Roots of Trees, although such are good and useful for stocks also if they have good Roots.

In weeding the young Seed-plants, some will come up with the weeds; set them again almost to the top, then water them, and all the rest.

In *Autumne*, when they have done growing, let them be transplanted into other Beds of ground prepared for that purpose, thus: Let the ground be digged, and cast into *square Plots*, or *long Plots*, as you will, and laid level with a Rake, then set the *young Seed-plants* therein in this manner. Having cast up the Borders handsomely on each side, stretch a *Line* from one side to the other, then take a *Setting-stick* (that is a hard piece of wood about a yard long, with a handle at the top, and made sharp at the end, or pointed with Iron) and thrust it into the ground half a foot deep, (or according to the length of the Roots)

close to the *line* and make holes all along from one end of the *line* to the other, about half a foot or more, as you will distance: And having prepared the *Seed-plants*, by cutting of all the *side Twigs*, and the *ends or bottome of the Roots*, set them in order in the holes to the top of their Roots, and close the mould about them: Draw the *biggest* first, and set them by themselves, and the *least* by themselves. Then take up the line, and stretch it again about a foot from the other *Plants*, and make holes, and prune more *Seed-plants*, and set them as before.

Let not the Roots be too long; about a handful in length (or less) is sufficient: for if their Roots be long, and set deep, the Trees afterwards are taken up with more difficulty.

Then take up the line, and stretch it again, a foot and half from the Plants last set, that there may be a convenient space of ground to pass between to weed the Plants, and to *Graft and Inoculate* them (being grown fit) And having made holes and pruned the Plants, set them as before.

And thus set the *Nursery* throughout, and many of these will be ready after one year to *Inoculate*, and after two years, or three

three, to Graft. Yea, many may be fit to Graft after the firſt year, and ſome fit to Inoculate the firſt ſommer.

Remove all Seed-plants

Be ſure to *tranſplant all young Seed-plants*, for by that means they get good Roots, which of themſelves, thruſt down one *ſingle Root*, for the moſt part. And being grown two or three years after *Inoculating* or *Grafting*, they are fit to tranſplant, to make *Orchards*, or into *Fields* and *Hedges*, at a competent diſtance, as ſhall be ſhewed when I ſpeak of *ſetting Trees*.

Thus men may in a few years, prepare multitudes of *Young Trees* for themſelves and others, to give or ſell as they pleaſe.

Some procure *Crab-ſtocks* from the woods, and ſet them to graft on, having grown a year or two; but theſe ſtocks are not ſo good as thoſe that come of ſeed. We ſee by continual experience, many are deceived by them, though ſome may do well.

Remove ſeed Plants after the Sommer.

And further obſerve, not only to remove all Seed-plants, as before, but let it be done the *next Autumne or Winter*, let them have but one *ſommers growth from the ſeed*, before they be removed to be prepared in the Nurſery, unleſs they be very ſmall; for there is advantage in it, above thoſe that grow where they are *ſown*

two or three years before removing: for these *small Seed-plants* are not only easily drawn up, and easily set againe, (with a small Setting-Instrument) but also (their Roots being but short) they taking Root, and spreading their Roots *near the top of the ground* they are easily taken up, and removed (after Grafting) having grown three or four, or more years, whereas such as grow *two* or *three* years upon the Seed bed before removing, they thrust their Roots very deep in the earth, and are not onely hard to be drawn up, but likewise their Roots when set again, must of necessity (though a great part be cut off,) be thrust down very deep into the earth, and then such spread their Roots deep, for they thrust their young Roots from the lowest part, where the Root was cut off, and so they neither have so good nourishment from the earth (as spreading below the best soyle) nor are they so easily to be transplanted when they are ready, as those other which are drawn the *first year*, and set very small as before.

Besides, the top of the earth is the best soyle, as having the Sun and Raine all the year.

This is very considerable, and therefore observe it: I underwent great inconveniencies when I came to Remove some, before I found out this observation.

Now

NOw for the manner of *Inoculating* and *Grafting* theſe Plants, being thus prepared, and grown fit.

Firſt, concerning *Grafting*: wherein we muſt conſider the time: *February* and *March* (uſually with moſt) are the two cheif *Months* for *Grafting*, but we may begin ſooner, and its beſt ſo to do, eſpecially with *Cherry* and *Plum grafts*: If the weather be open, without Froſt in the beginning of *January*, or in *December*. Yea, I have grafted ſome (with good ſucceſs) in *November*, and ſooner, but in the *beginning of January* we may begin, if Froſt hinder not. And ſuch as have *multitudes* to *engraft* muſt needs begin early, elſe they'l want time. *The time of Grafting.*

Grafts of *Cherry* and *Plum-trees*, muſt be grafted ſooneſt, becauſe they bud ſooneſt. And begin with them, ere they begin to Bud forth, and then with *Pear-trees* and *Apple-trees*.

Grafts of any kind may be gotten and kept many *dayes*, or many *weeks*, the one half in length, being covered with mould; and not many together, for if ſo, thoſe in the middle will dry, and be ſpoyled, in certaine dayes: but lay them thin in *How to keep Grafts.*

the mould; or they may be grafted immediately, so soon as they are gotten. *Grafts* none but those of one years growth, onely the last years sprout, the fairest and thickest are best: They may be carried many miles, being bound up close (from end to end) in a hay-band, or better in a Box of Mould, or their ends stuck in clay, and wrapped about that they bruise not.

Instruments for grafting.

That this work may the more effectually be done, we must have fit Tools, and Instruments for that purpose: First, a *good sharp knife*, and strong, to cut off the top of stocks. A neat *sharp saw*, to cut off the head of some stocks which are grown too big for the *knife*: also a little *Mallet* and *Wedg*, to cleave the big stocks, a small *Pen-knife*, to cut the *Grafts*, (as I shall shew you anon) and keep it very sharp for this purpose onely: There must be likewise *Clay* prepared with *horse-dung*, well mixed together, as *Morter*, about two parts Clay. And *Rushes*, or *strong*, *soft Flags*, to bind together the *Graft*, and the *Stock*. With a small *hand-basket* to carry the *Grafts* in, with all the *Instruments* for the work.

What flags are best.

Manner of the Work.

Having these things in a readiness, the time being come, go to the *Stocks* that are ready (small or great) And those that are small (about the bigness of ones little fin-

get

ger (which are of a competent bigneſſe, and we looſe no time in making uſe of them) *Graft* them in this manner.

If they be *Cherry-ſtocks*, or *Plum-ſtocks*, to make *Wall-trees* of, graft them low, with-in half a foot (or leſs) of the ground, but if they be for *Standards*, then Graft them a nell, or yard and half high; if the ſtocks are of a convenient bigneſs of that height, elſe graft them lower, where they are of a competent bigneſs.

1. Cut off the top of the *ſtock* in ſome ſmooth, ſtraight place, that may be anſwerable to the ſtraightneſs of the *Graft*, when ſet on; Then prepare the *Graft* thus: obſerve which ſide is ſtraighteſt at the bottom, or biggeſt end, that ſo it may be the ſtraight part of the ſtock when ſet on: Then cut *one ſide only of the Graft*, downe ſlope, about an inch long, or little more; either from the *knot* or *ſeam*, * (if the part below it be ſmooth, and ſtraight) or elſe from a *Bud* or from any part; and cut through the *Barke*, at the top of the cut place, and make it like a ſhouldier, that it may reſt juſt upon the top of the ſtock, but cut not this ſhoulder too deep, (onely through the Bark or little more) but cut the graft thin at the bottome of the cut place, yet leave on all the Bark

The firſt way of grafting, called, ſlicing or backing on.

**Which is a circle round about the graft diſtinguiſhing the laſt ſummers growth from the former.*

on the oppolite ſide, make this cut ſmooth and even, from the top of it to the bottome, without dints or ridges, (which is of ſpecial concernment) that ſo it may be ſure to joyn cloſe to the *Stock*.

The *Graft*, being thus prepared, then go on to prepare the *Stock* further, by the cut part of the *Graft* upon the ſtraight ſide of the *Stock*; and meaſure juſt the length of the cut part of the *Graft*. And (with a knife) take away ſo much of the *bark of the Stock*, * but cut not any of the *wood of the Stock*, then lay the cut ſide of the *Graft*, upon the cut part of the *Stock*, and let the *ſhoulder of the Graft*, reſt directly upon the top of the *Stock*, ſo that the cut parts of both may joyne *even and ſmooth* all along, and ſo bind them together cloſe, with ſome ſtrong *Ruſhes* or *Flaggs*: then Clay them, lay on every ſide, and an inch above, and as much below, ſome of the *Clay* prepared as before, cloſe it above, and below, and on every ſide, that no rain get in: and this is all needs to be done for that time.

* *If it may be upon the Weſt, or South-weſt ſide of the Stock; becauſe if ſo theſe winds (which are moſt dangerous) cannot ſo ſoon break off the grafts, as on the other ſide. I have loſt many before I obſerved this courſe.*

This I account the beſt way of *Grafting* for divers *Reaſons*:

1. Firſt, becauſe in this way of *Grafting* we may make uſe of the *Stock*, divers *years* before they will be ready to graft in the Cleft; by this way of Grafting, the trees will

will be ready to bear, before they will be ready to graft the other way.

2. Secondly, This kind of grafting is less hurtful both to the stock and graft; for cleaving the stock is danger, and hurt to it, being cloven (as it must) in the middle to the very heart: whereas in this way of grafting, it remains whole and entire, save only a small part of the Barke taken off. And as for the Graft, in Cleft-grafting, it must be cut on both sides, to the heart, and made thin, but *in slicing or packing on*, it must be cut onely on one side, and so less hurtful to the Graft.

3. Thirdly, When stocks are cloven, if they be somewhat great, commonly the Raine and Aire gets into the cleft, and rots the middle of the stock, before the Graft can grow over to cover the head of it, which is not incident in this way of Grafting.

4. Fourthly, This way of Grafting is much more easie to do, and more sure to take and grow, then grafting in the cleft, for the graft & stock joyn more close and easily, then can be in cleaving the stock.

5. As this way is easily done, and more sure, so also is it more speedily done, then any other kind of Grafting.

So.

Second way of grafting, call'd whip-Grafting.

Secondly, There is another way of *Grafting small ſtocks*, ſuch as are but ſo big as the *Grafts* you mean to ſet on. And thoſe *Stocks* are prepared thus: The top being cut off over againſt a ſmooth ſtraight place, as before; the *Bark* of it muſt not onely be cut, but alſo the *Wood* quite through to the back ſide of it at the top, directly like as the Graft is cut (as was ſaid) in length as much as the cut part of the Graft; the manner of cutting the Graft for this, is the ſame with the former: then lay the cut part of the *Graft*, upon the cut part of the *Stock*, and let the rind of the *Stock* (even the very bark of the outſide) be directly under the ſhoulders of the *Graft*, that ſo the cut parts both of *Graft* and *Stock*, may joyn, and anſwer one another from the top to the bottom: and ſo bind and clay them as before.

Third way of Grafting

Thirdly, There is another way of *Grafting* generally practiſed, though not ſo ſure as the two former, and yet a better way for *great ſtocks*, for none but ſuch *ſtocks* are capable of the two former ways: it is thus: Thoſe ſtocks that are large (three or four inches in compaſs) muſt be cloven, the top being cut off in a ſtraight ſmooth place, cut the roughneſs of the top ſmooth with a ſharp knife, then knock

a strong *knife or chissel*, a very little be-
the pith, and if it be capable but of
graft, then be sure to cleave it on that
side that is smooth and straight, if it be fit
for two as it is, if it be about an Ell high,
and a strong stock, then be careful to chuse
both sides smooth, being cloven with the
knife, and a *wedg of Box*, or other hard
wood knockt in to keep it open, then pre-
pare the *Graft* or *Grafts* you mean to put
in, cut both sides of the *Graft* aslope down
from the *knot or seam*, if it be straight, or
else from a *Bud*, about an inch or little
more, shoulder both sides of the *Graft*, as
was said of one side, for the other sort of
grafting, and make it thin at the bottome.
Let the *outside of the Graft* be somewhat
thicker then the *inner-side*, unless the stock
be very big, if it be so great to pinch the
Graft much, then make the *inner-side of*
the Graft thicker, a very little, that so it
may preserve the *outside* from being pin-
ched too much.

And in setting in all *Grafts* into the cleft, observe this for *a most special Rule, to joyne the inner-side of the bark of the Graft, to the inner-side of the bark of the stock*, that the sap may more easily come out of the *Stock* into the *Graft* to feed it, for the main cur-
rent of the *sap, is between the bark and the wood*. *A special Rule.*

Some

Some take care to set the out-sides even and *smooth*, but that is an *error* in practice; for we know the Bark of a big stock is much thicker then the Bark of a slender graft, and if the outsides be *smooth* and even, the insides must needs be *uneven*.

But I say, to joyn *the inner sides of both barks together, all along the cleft*, is the *principal thing in grafting* of such big stocks.

The *Grafts* being thus placed in the *Stocks*, and the wedg pulled out, then Clay them close on every side, an inch above the top of the stock, to the bottom of the Cleft.

Choice of Grafts.

In chusing *Grafts*, chuse not those that are very small, and slender, they commonly fail; but take the fairest upon the tree, and especially those that are fullest of *Buds*.

Cut off the tops of Grafts.

The tops of long Grafts, are to be cut, that they may spread the better: and of such as are but short; if there be blossom buds on the top, as it's commonly seen in *Pearmains*, and many other good bearing kinds.

Joyn right kinds together in Grafting.

Graft every *Cyence* into its own kind, as all kind of *Apples* together, and also on *Crabstocks*, (which is the *wild Apple*) *Pear-grafts* on *wild Pear-stocks*, and the like of other kinds: joyn not contrary or different kinds, they never come to perfection

Cherry-grafts, or *Plum-grafts*, or the like: Experience makes it manifeſt to be but loſt labour, they'l grow (it may be) a year, or two, and then die.

And in *choice of Grafts*, be ſure to conſider what Trees (of all kinds) are the beſt bearers, ſome kinds ſeldom miſs, and ſome other kinds (though good fruits) ſeldom bear, and therefore take information from thoſe perſons, that know (by experience) the nature of the trees in this regard, and accordingly chooſe, or refuſe grafts from them. Obſerve the like in choice of *Vines*. *Obſerve the beſt bearing trees.*

Such *Grafts* as are bound (as is ſaid of the two firſt wayes of *Grafting*) muſt be *unbound* after a certain time, when they have well cloſed with the Stock: *about Midſommer* they will be faſt enough upon the Stock, ſo that they may without danger be *unbound*: but if they be not *unbound*, the band ſometimes girds and dints in too much, unleſs of ſome, where the band rots or breaks: and beſides the *winds* (when the grafts are *grown* big and bushy) will indanger the breaking of divers of them, unleſs they be *unbound*, and alſo by ſome means ſupported, and ſtrengthened at the grafted place, which may be done, by tying a ſmall ſtick to them a little above, and as much below the place where it *Unbinde Grafts.*

is

is engrafted; but before you thus bin
the ſtick to ſtrengthen the Graft, put
little clay round about the engrafted pla
(being unbound) it will cauſe the
ſooner to cover the head of the ſtock.

But if the *Grafts* be *Grafted* near un
the ground, or not above half a yard hig
they will not be ſo much in danger
breaking by the winds eſpecially ſu
whoſe growth is moſt into one ſingle *ſto*
or two; and ſuch as grow but upon ſma
or weak ſtocks: as to ſuch, this labo
(in tying the Graft, to ſtrengthen it in th
grafted place) may be ſpared: Thoſe th
are *high ſtocks*, and of *ſtrong growth*,
ſhoot forth their Grafts *vigorouſly*, and
to a *great head of many branches*, are m
indanger of *winds*, eſpecially the *W*
winds, (which are commonly ſtronge
for the firſt year, and more, a week
fortnight before and after Midſommer; be
ing they are yet tender, and not well cl
ſed with the ſtock; ſo that theſe eſpecia
ly muſt be taken care of in this regard, o
ly for the *firſt year*, after there's no da
ger at all of *breaking by the winds*. So
kinds of *Plags* (wherewith we bind Gra
are ſo *tough* and *ſtrong*, that they will n
yield a jot, nor *break* with the growth a
ſwelling of the Stock and Graft (as ſo
oth

Bands do) and therefore there is more need to look to such, to cut or unbind them, as before is said, lest they cause dints or circles in the place where they bind, the barke swelling on both sides of the binding, and this makes the Graft more in danger of breaking, unbound, and strengthened in that as before.

After Grafts have had their full growth the first year, they must be *Pruned*, such as *Pruning*: as for *wall Plums*, it's no matter of how many Branches they spread, more the better: but for those that are Grafted low, and yet must be made Standards, leave only one shoot, *the straightest and biggest shoot*, and cut off all the rest, and let not that straight shoot begin to spread, till it be an *Ell long* at least, rather more, and then let the Branches spread, and enlarge themselves. *Prune some young grafts*

But herein observe, that unless these young Grafts put forth a *strong and lusty* shoot, do not prune off the *side Branches*, lest the body of the plant be too *small*, and not able to bear his head; as is often seen in Nursery where plants grow close, and stand together: if the body be very slender then suffer some of the *side twigs* to grow, until the body be of a sufficient strength to bear the top. And

And from year to year, prune off those shoots and branches as are superfluous and grow too near one another, and preserve onely such as are fit to make the Tree of a comely form. And if any spire up, and shoot too strongly upwards in the middle of the Tree onely, and spread not sufficiently (as is often seen in *Pears trees* and some other trees) cut off from time to time those strong shoots in the middle, and still preserve the outmost branches, for all Fruit-trees, ought to spread as much as may be, so that the branches hang not too near the ground.

And so much concerning *Grafting*, and also pruning while they are young Plants.

I shall now speak of the other way whereby Fruit-trees are increased, *Inoculating*, or putting a small Bud into a Stock, which (as to the effects of it) is the same with *Grafting*, but differs much in the season, and in the manner of the work.

Inoculating Buds.

The time for *Inoculating Buds* is about *Midsommer*, a fortnight before, and a fortnight after is the chief season, though some Plants (full of Sap) may be done afterwards with good success upon young trees or stocks, even so long as the bark will rise. And take heed of beginning too soon with

Buds before they have attained a ſufficient ſtrength and growth: ſome will not be fit to *Inoculate* until *Auguſt*, and ſo in what Month upon ſome ſlim ſappy ſhoots.

That this buſineſs may be done to good purpoſe, it muſt be conſidered whether the *Buds* we mean to get, are ſufficiently grown or not, they muſt not be *too young & tender*: and we ſhall find that ſome kinds of Trees have buds ready ſooner then others. As the *Aprecott* eſpecially, and thoſe that ſhoot ſtrongly. Let then the biggeſt and ſtrongeſt *ſhoots* be cut from the Tree, that have grown ſince the ſpring to that end, and cut off the top of the ſhoot (all the *Buds* that are too ſmall and tender) and alſo cut off the leaves of the other, about a quarter of an inch from the *Bud*, and by that part left, we hold the *Bud*, being taken off the branch: but leave not on the whole *leaf and ſtalk*, as ſome do, for the aire (by means of the leaf) exhauſts and draws out the ſap of the *Bud* in a ſhort time, and ſo ſpoils it.

Then go to the Plants you intend to *Inoculate*, which muſt be like (as to the ſeveral kinds) with the *Buds* that you intend to ſet on: as *Aprecott-buds*, and other *Plum-buds*, on *Plum-ſtocks* that are

Obſerve the kinds.

wild ſtocks: the white *Pear-plum* ſtock is accounted the beſt to *Inoculate Apricock-buds* on, or other choice *Plums*, it being a Plant full of ſap: and in chuſing *Buds*, or *Grafts*, be ſure always to cut them from thoſe kinds that (experience ſhews) are good bearing *Trees*, as well as good *fruit*.

Now in ſetting on the *Bud*, firſt make a croſs cut upon ſome ſmooth place of the ſtock, (if it be for a wall-tree, then half a foot or a foot, or thereabouts from the ground) and from the middle of the croſs cut, make another ſtraight down, about an *Inch long*, only through the Bark, and with the end of a Pen-knife, raiſe up the Bark on both ſides, as much as to let in the ſmall *Bud*, then make haſt to prepare the *bud*: for a man muſt be quick at his work, elſe the Aire, by ſudden drying the *Bud*, and the cut part of the ſtock will much hurt:) Cut the bark on both ſides the *Bud*, and about a quarter of an inch above, and as much below the *Bud*, let the end which is to be downwards, be a little ſharp, that it may more eaſily go down betwixt the Bark and wood of the ſtock, and throw away the Bark on the oppoſite ſide of the *Bud*, then with a *Quill*, the half cut away, or a *Pen of ſteel* (made for the purpoſe, like the one half

Goose-quill) take off the *Bud and Bark*, by putting it between the Bark and wood: and be sure there be the *root of the Bud in it*, if there be a little hole in the *middle of the Bud within*, then the *root* is not there, throw away that bud, such will not grow, but the *Bud* being well taken off, then hold it by the stalk of the leaf, as before was said, and put it carefully *between the bark and the wood* of the small Plant prepared as before, and set the top of the *bud* joyne close to the cross-cut, in the upper end: then bind the *bud* with a soft *Rush*, or *Flag* that is strong, bind it close to the stock, especially in the middle where the *Root of the bud lies*, but not just upon the *Bud*.

After a certain time, the *Buds* must be unbound, and some sooner then others; some stocks grow more in a week, then some others in a month. *Unbind buds in due time.*

Now, if this work be done early in the year, before *Midsommer*, upon young *stocks* very full of sap, these may be unbound against twenty days after, or a *General Rule* may be this, when a stock is so grown, as that the band about the *Bud* does much straighten the *Bud*, which may be seen by the swelling of the Plant above and below the *Buds*, then the band must be cut and then off. But those that are near the end

of *July* or after, will not need unbinding so soon. But take heed of making too much hast to unbind *buds*; there's less danger in suffering them to be long bound then the contrary.

Now after unbinding, you may know which *Buds* take hold of the stock, and which do not; those that are good, will fall upon the stock, and appear in their natural colours as when they were set; those that do not hold, will have lost their colour, and (it may be) be withered or dried.

Cut off stocks above the Buds.

Such as are good, meddle no more till the Spring, then cut off the stock an inch or two above the *Buds*, so the *Buds* will spring out and grow according to the strength of the stocks. And in *Autumn* after they may be transplanted, or if you please, such *Buds* may be transplanted the next *Autumne* after *Inoculating*, which is the surer way for growing. And when these *Buds* have grown one year or two, then cut off the stock close to the *Buds*, and they will cover the head as Grafts.

How to carry Buds.

If *Buds* be not ready at hand, but must be fetcht many Miles in that hot time, then special care must be taken in the carriage of them. Thus, being cut from the Tree, cut off the tops of the Branches, and the leaves

[illegible] near the *Buds* as before, then bind [illegible] together, and wrap them in *fresh* [illegible] or *grass* to keep them cool, and they [illegible] keep good two or three dayes, but yet [illegible] all the hast that may be to *Inocu*[illegible] them. (a)

(a) *Buds of Apple trees, Pear, Cherry, or Plum, may be Inoculated, as Aprecots, and Peaches, if the shoots be strong and large.*

[illegible] *Grafted or Inoculated stocks*, make [illegible] *Letter* or two, or write the name of [illegible] Fruit at length upon the stock below [illegible] *Graft* or *Bud* (whereby to know the [illegible] of the Fruit) and if any be stollen, [illegible] may thereby be known, being found [illegible] It's done with the point of a Pen[illegible] cutting through the Bark, the form [illegible] Letter, or any other Figure or Cha[illegible], whereby to know the kinds of [illegible] And so much for *Inoculating Buds* [illegible] *trees.*

Mark the Stocks.

[illegible]He choice of right kinds of *Grafts*, [illegible] *and Stocks*, and the joyning of them [illegible]ther according to their natures, is so [illegible]ssary, and some observations about [illegible] are so *essential* to the work of profi[illegible] planting, that except they be known, [illegible] practised, men loose much of the pro[illegible] they might have, if rightly observed.

Directions in the choice of Grafts and Stocks.

[illegible]ew *special directions* in any Art, *though* [illegible]ting but of few lines, containing the [illegible]*ples*, and *essential parts*, are better,

and more to the advancement of the Art, then great Volumes upon the same Subject, when men (as many do) cove about upon unnecessary things, and strange fancies, without any solid grounds, beside the [illegible] of the business. If men miss the *Principles, and essentials of an Art*, they discourse of it to little purpose.

So also in the practise: and therefore it has many times fallen out, that some men having laboured much, and spent much time and cost in *Planting Fruit-trees*, yet their labours have not succeeded well, because there has been mistakes in *some principal*, and *very material things*; either the Trees have not grown well, or if prosperod, and come to a large growth, yet they have not born Fruit well, or if growen and born fruit, and store of fruit, yet the fruit hath not been right good, and the best, it hath been a great discouragment, not onely to themselves, but to others who have seen it.

Now, among all *Observations* about the *Art of Planting Fruit-trees*, I know none of *greater moment*, or *more essential* to the profitable proceeding in it, then the *choice of right Kinds*, and *the joyning of Grafts, Buds, and Stocks fit for each other*. I shall therefore mention some particulars of these

Twelve

Touching kinds of Fruit-trees, which I have made choice to speak of, and shew which I account most *profitable, and best to propagate and increase, and how they fit several stocks* when the *Cyences are to be Enarched, or buds Inoculated.*

First concerning *Apples*: In the choice of *Apple-Grafts*, we must consider not only the *goodness of the Fruit*, but also, whether the Trees be *good bearing Trees naturally*, whether such as have known them divers years, can say by experience, *they bear well*, but many look not after this so much, as what kind of fruit it is, *in respect of goodness*. And thence it comes to pass, that some men having store of faire, large Fruit-trees, they have but little fruit from them. Therefore let the *generality of Fruit-trees* (both in the *Orchards* and in the *Fields*) be of right *kinds in respect of bearing*, as well as in respect of *goodness of the fruit*; and then for *variety*, there may be some of other kinds of good and choice fruits, though they bear but few and seldome.

1. *Of Apples Chuse the best bearing kinds.*

And for particular kinds of *Apples*, I commend the *Sommer Pearmain*, and the *Winter Pearmain*, not onely for special fruits, but also for *good bearing kinds*. So likewise the small spice *Pippin*, a good Ap-

ple, and great bearer; The Harvey Apple is a very choice fruit, and the Trees bear well. The *Queen Apple* is a great bearing fruit, and good, so the *Gilleflour*. Many other kinds might be named, that are special good fruits, & great bearing kinds, and some prefer one kind, and some another. But the *great* and *general Rule* in this, and all other kinds of fruits, is, to take Grafts from those Trees which are known by experience to bear store of fruits, and good, and to multiply these as much as may be.

* *The Golden Pippin, a very special Apple, and great bearer, great Russeting, Kerton Pippin, Holland Pippin, as some call it.*

As for *Stocks* fit for *Apple Grafts*, I account *Crab-trees* better then sweeter *Apple-trees* to graft on, because they are usually free from the *Canker*, and will become very large *Trees*, and will last longer then Stocks of sweeter *Apple-trees*, and will make fruits more strong, and hardy to endure *Frosts*, and cold *weather* in the *spring*; yet it is good to chuse stocks of some pleasant Apples, to graft some choice fruit upon; Because that the stock hath some small influence upon the fruits, to make them more delicate, if grafted upon a *choice stock*. Although notwithstanding the graft may be said to Governe, as is shew'd at large.

2. *Of Pears.* As for *Pears*, there are multitudes of kinds, as well as of *Apples*, some preferring

one

and some another, and one and the same fruit is called by several names, in several places. A late Author sayes, he is perswaded there are 400. or 500. *several kinds of Pears.* Now therefore, it is a point of wisdom to chuse *Grafts* from the best bearing *kinds*, although (it may be) not so delicate to eat as some others. I know none but they are very useful and profitable.

The *Windsor Pear* is accounted one of the best with us, some kinds bear not well, but some others do, therefore observe the former *Rule.* The *Sommer Burgamot* is a choice fruit, and the Trees bear well; so do the *Winter Burgamot.*

But for a constant bearing kind. I know none better then the *Catherine Pear*, both the *Russet* and the *Red*; but they must be quickly spent, for they are no lasting fruits.

The Winter Boncretien is an excellent fruit, so the sommer, but bears not so well as the winter kind.

The *Greenfield Pear*, is an excellent *Pear*, and a *great bearer.* There is a *Pear* they call a *Choke Pear*, which is accounted a special kind for *Perry*, although the *Pear* to eat, is stark naught, and therefore men may adventure to plant the Trees in the *hedges and hedges*, and need not fear stealing of the fruits. I advise (for that reason) to plant many of the Trees, on purpose

to

to grind the fruits for *Perry*. Mr. *Parkinson* saith, the *Perry* of these *Pears* is scarce discerned from Wine, neither by taste nor colour after it hath been kept certain months.

The best kind of *stocks* to graft *Pears* upon, are such as come of the *Seeds* or *Kernels of Pears*. I know no difference among these, but all good to graft upon. And I utterly dislike grafting these *Fruits* upon *White-thorne*, or upon any kinde of *Stocks* beside *Pear-stocks*. The fruits are naught (having a hard and stony core) if grafted upon a *Thorne tree*.

3. *of Cherries.* There are many kind of *Cherries*. The *Flanders-cherry* is most generally planted here in *England*, and is a *great bearing fruit*. Some of them (if planted against a *South wall*) are almost as soon as the *May Cherry*, they follow close after: The *May Cherries* are tender, the Trees must be set in a warm place, upon some smooth *South wall*, or *morning Sun*, but the *Flanders* best will in Orchards, and Fields at large.

The *black Hart-Cherry*, is a very special fruit, and a *great bearing-fruit*; and doubtless exceeding proper to plant for Wine either to drink of it self, or to mix the juice with *Cider* to give it a *colour*, as *Claret wine*. It being of a deep red, & a small quantity of it, will *colour* a *gallon* of *Cider* or *white*

There is a *Cherry* we call the *bearing cherry*, of Mr. *Miller*. It may well be called the *great bearer*, for the trees seldome fail of great store of fruits, though in a cold, and sharp spring. It is something a tart fruit, of a very deep red, almost blackish, when full ripe. The juice very proper to colour *Cider*, *Perry*, *wine*, or the like.

These kinds are not ripe so soon as they are red, as the Flanders are, but should stay 10 dayes, or a fortnight after, until they become a very deep red: These (becomewhat late ere they be ripe) will hang upon the Trees until *October*, or after, especially if the Trees grow in the shade, and then they are rarities as much, or more then those in *May*; the *White-cherry* (a right kind) is a delicate fruit, there are many more kinds, I have above twenty several kinds of *Cherries* in my *Garden*. The *great bearing Cherry* aforementioned is most fit for *cold Countries* in the *North parts*, and although it be not altogether so pleasant as some other *Cherries*, by reason of the tartness of the juice, yet we must know, that *sharp Cherries* are more wholsome then the *sweet*. And such as plant trees of this kind, may have good store of fruit, when others (it may be) want, who have none of these Trees. Con-

Concerning *Stocks* fit for *Cherry-trees*, account the *Black-Cherry-stock* the beſt to graft any kind of *Cherry* upon. Yet ſome hold the *Red-Cherry-ſtock* is beſt for *May Cherries*. But the *Black Cherry-ſtocks* are goodly ſtraight Plants and full of Sap, and become greater Trees then the *Red Cherry-trees*.

5. *Of Plums.* There are very many kinds of *Plums*, many more then of *Cherries*. I eſteem the *Muſle-Plum* one of the beſt, being a faire large Purple-pluſh, and of an excellent reliſh, and the *Trees bear abundantly*. The *Damaſcene* alſo is an excellent fruit. The *Violet*, and *Premorden Plum-trees*, are very *great bearing Trees*, and the fruit pleaſant and good. The *Damaſco-Plum* is a good *Fruit*, and the Trees bear well.

Many other kinds might be named, very good Plums; ſome approve of one kind, and ſome of another, but the drieſt plums which paſs from the ſtones, are accounted beſt.

Plum-Grafts muſt be grafted upon *Plum-ſtocks*, not upon *Cherry-ſtocks*, or any other kind of *ſtocks*, that I know. The *White Pear-plum-ſtocks* are accounted the beſt and the *Damſon-ſtocks* the worſt, being dry *ſtocks*; ſo that *Grafts* cannot ſo well take, nor thrive upon them.

Thoſe

[illegible] *stocks* of *Plums* which have large [illegible] and full *shoots*, I account the best, as [illegible] fullest of sap.

[illegible] not *Plum-grafts* upon *Cherry stocks*, [illegible] *Cherries* upon *Plums*, as some prescribe: [illegible] *kinds* will not *agree together*. They [illegible] (it may be) a year, or two, & then die.

5 *Of Aprecocks.*

Though *Aprecocks* are (in the general) [illegible] *Plums*, yet because of the ex[illegible]ency of the fruit, they may be spoken [illegible] themselves. I know but few kinds of [illegible], but some I know to be far *better* [illegible], some are larger then others; and [illegible] *sooner* ripe then others; all *good fruits*. [illegible]'s one kind that is a very *great bearer* [illegible] a faire large fruit, observe then those [illegible] that usually *bear well*, and get *Buds* [illegible] them at the season to *Inoculate*, as is [illegible]'d pag. 50. for these must be *propaga*[illegible] only by the *bud*, not by *grafting*. I ac[illegible] the *White-pear-plum-stocks* the best to [illegible] *Aprecock buds* upon, *although* they [illegible] be done upon other *Plum-stocks* with [illegible] *success*, if they be *good juicy stocks*, able [illegible] a large *nourishment*, for *Aprecock*[illegible] require much nourishment. I shall *joyn* [illegible] *Nectrine* with the *Aprecock*, although [illegible] kind of fruit. The best kind that [illegible] is the *Roman red Nectrine*. But [illegible] very hard to be propagated; as

for

for *Grafting*, none take that way, and [illegible] few with *Inoculating*, which I conceive [illegible] the reason it is the dearest of all Pl[illegible] with us. The *Yellow and Green Nectrin*[illegible] are much short of it in goodness.

The *White Pear-Plum-stock* (though [illegible] counted the best for any *plum*, yet I [illegible] it [illegible] good enough, for this fruit to [illegible] *Inoculated* upon it, though some do indi[illegible] great Well.

But I hold it best to *Inoculate* the *R*[illegible] red *Nectrine* upon the Branch of an *A*[illegible] peach, which before hath been *Inocula*[illegible] upon a good *Plum-stock*, that it may [illegible] not only a larger, but a finer nourish[illegible] than ordinary *Plum-stocks* can do: [illegible] these stocks they take and hold exceed[illegible] well, and also upon *Peach-stocks*.

6. Of *Peaches* there are divers kinds [illegible] *Of Peaches.* known by experience; the *Nutmeg*, [illegible] *Newington Peaches*, to be excellent tal[illegible] fruits, and very good bearers, especia[illegible] the *Nutmeg-Peach*, which makes amen[illegible] for the smallness of the fruit: but t[illegible] *Newington-Peach*, is a very large and g[illegible] fair fruit.

These require choice *Plum-stocks* to [illegible] *Inoculated* upon, as the *White Pear-plu*[illegible] stock, or else stocks comming of *Peac*[illegible] stones.

I know but one kind of *Figs* that come [illegible] ripeness with us in *England*. The [illegible] *Blew-fig*, as large as a *Catherine-[illegible]*. 7 *Of Figs.*

The Trees grow in divers Gardens in [illegible], and bear their fruits to perfect [illegible]ness; The trees must be set against a [illegible] *wall*, and be spread up with nailes, [illegible] Leathers; or if Planted upon warm [illegible], and in a warm place, they will bear [illegible] on Standards.

These Trees are increased from the [illegible] of the old Tree; draw up the small [illegible], and plant them; These need nei[illegible] *Inoculating*, nor *Grafting*: also bend [illegible] boughs (that are lowest) down into [illegible] earth, and they'l take root, as Vines, [illegible] may be cut off, and transplanted.

Some Authors affirm that there have [illegible] *Vine-yards* in *England* in former [illegible], though they be all destroyed long [illegible]. Divers places retaine the name of *Vine-yards* still. At *Bromwel-Abby* in *Nor[illegible]*, and at *Elie* in *Cambridg-shire*, which [illegible] wine: what else is the meaning of these old Rimes? 8. *Of Grapes.*

[illegible] sunt Eliæ, Lanterna, Capella, Mariæ
[illegible] Molendinum, nec non dans Vinea vinum.

English-

Englished thus:

Foure things of *Elie Towne* much sp-
ken are,
The *Leaden Lanthorne*, *Maries Chap-*
rare.
The mighty *Mil-hill* in the Mind-
field,
And fruitful *Vineyards* which sw-
wine doe yield.

And doubtless men might Plant *Vi-*
with good success, to make good wine
ven with us. There are many kinds
Vines, but I know none so good, and
for our Climate as the *Parsley Vine*, w-
the white and red muskcadine, we see
experience yearely these beare abundan-
of fruits unto perfection. And whos-
ver will plant *Vines* in England, I think
cannot meet with better kinds than the-
both for *bearing and goodness*.

See more at large in the Table.

Or Canada Grape.

The *Frantiniack Grape* is of great A-
count with many, and is a special fru-
where it comes to perfect ripeness, whi-
it hardly does, except the *Vine* be set
on the *South-wall*, where it may have m-
sun.

The *Red*, and *white Muskcadine Gr-*

special fruits, and bear very well, and
come to perfect ripeneſs, if the *Vines* grow
upon the *South-wall*, or upon the *Eaſt-*
wall, which is beſt next.

There is the *Curran Grape*, *Cluſter Grape*,
and many other kinds of good *Grapes*;
and the fruits are *better* or *worſe*, accor-
ding to the *place* they grow in; If they
have *much ſunne*, and be *well ordered*, the
fruit will be *better* and *ſooner ripe*.

Vines are increaſed by laying down
branches into the earth, in the *winter*, or
ſpring; letting them grow ſtill upon the
Vine, until *removing time* the year after;
and then they may be cut off, and the
roots taken up, and planted elſewhere:
or the *Cuttings* will grown laid in the
ground in the *winter*, or *ſpring*, though
they grow but weakly & ſlowly for a year,
or two.

9. *Quinces:*

We have in theſe parts the *Engliſh*, and
Portugal Quinces; the *Portugal* Le-
mon as the better, both for *bearing*, and
fruit. Theſe are increaſed by *ſuckers* from
the Roots of the trees; and the boughes
cut off, and cut in pieces *a yard long*,
more, or leſs, and layd in the ground,
will grow (as *Vines* and *Mulberry cut-*
tings) and bear the ſame fruits; Theſe
kind of trees are commonly *long* ere they
bear fruits.

It is observed that *Pines-trees* bear much better in *fat moist grounds*, than in *dryer grounds*, as is seen upon some Dunn *sides*, and *ranck soyles* about *London*.

10. *Of Mulberries.* There are two kinds of *Mulberry-trees* with us in England, the *Black*, and the *White*. As for the *White* I never saw any of its fruit, they very seldome bear well with us. But the *Black Mulberry-tree* never failes of fruit after it is grown up. These trees are not increased by *Grafting* or *Inoculating*, but by *Cuttings* from the Branches, or sides of the trees: Cut a bough as big as a mans arme, and after cut it in small Truncheons, or pieces a yard long or lesse, lay these small and great, in the ground a foot deep, only the one end out of the ground a hands bredth or two, or there abouts in good *fat ground* somewhat *moist*, and after a year, or two, divers young springs may be drawn from the Roots, and Planted at a fit distance, and the old Roots will yearly send out more, also the branches may be bowed down and layd in the earth, on one, or several sides, which will take root and multiply abundantly, and be fit to be transplanted.

11. *Of Medlers.* *Medlers* may be grafted, (and they take well upon a *White thorne*, but I much

their approve the *Grafting* or *Inoculating* of them upon *Pear-ſtocks*: and the fruit will be much *better*, and the trees much *larger* then upon *White-thorne*.

Walnut-trees are propagated from the *Nuts*, which may be ſet from the time of *Autumnes*, until the ſpring, an inch deep or little more, and afterwards tranſplanted, and ſet at a very great diſtance, 24. or 30. yards aſunder, for they are very large ſpreading trees. 12 *Of Walnuts.*

But if they are planted on the *North* or *Eaſt-ſides* for *ſhelter*, then ſet them nearer. Be ſure to chuſe of the beſt Nuts to ſet, the *faireſt* Nuts, and *thinneſt ſhells*, and *good bearers*.

Thus much (briefly) concerning *the beſt bearing Trees*, and how they are propagated.

As for thoſe *Fruit-trees* which bear but little or no fruits, by reaſon that *Grafts* and *Buds* were not choſen from *good bearing kinds*, wherewith they were engrafted, I adviſe (by all means) to *Graft* or *Inoculate* them again, though great, and old Trees, ſuch whoſe boughs are as big as a mans hand or wriſt, or ſmaller, may be cut off, and grafted in the Cleft with a couple of good Grafts, of *good bearing kinds*; but ſuch Branches as are very great, I ſhould *Graft old trees, if bad bearers.*

rather cut off a convenient height from the ground, slope-wise, that no wet may rest on the top, and then after a year or two, to graft the small shoots or branches that are put forth, or some of them; this is a better course then to graft such great Branches, for that moisture will get into the top, and rot the Branches, and perhaps the Body too, ere the grafts can cover such great heads.

Make Arbours of fruit-trees.

As concerning *Arbors, Seats, &c.* in *Orchards and Gardens*, I advise men to make them of *Fruit-trees* rather then of *Privet*, or other rambling stuffe, which yields no profit, but onely for shade. If you make them of *Cherry-trees, Plum-trees*, or the like, there will be the same advantage for *shade*, and all the *Fruit* superadded.

All that can be objected, is, that *Fruit-trees* are longer in growing up, then *Privet, Virgin-Bower*, or the like, whereof *Arbors* are commonly made. It is answered, Though *Fruit trees* are something longer in covering an *Arbor*, then some other things, yet they make sufficient amends in their *lasting and bearing fruits*:

And besides, such *Cherry-trees*, and other kinds, may be set about the *Arbors*, as will reach and cover even the first year.

I Shall now give some *Rules* concerning *Transplanting young plants*, after a *years* growth, or more, whether *Inoculated* or *Grafted*. *Of Transplanting Trees.*

The *time* for this work (in general) is *Autumne*, when Trees have done growing, and that is divers weeks before the leaves fall. Stay not (as the custome is) till *November* or after, before you *Transplant*, for the best time is about the latter end of *September* to begin; and so on, all the *Winter*.

It's a great advantage to remove *plants* betime, for such grow a while after in their root before *Winter*, and thereby not only preserve themselves in *Winter*, but also take some preparation against the *Spring*; which those *removed in Winter* cannot do. *Early removing best.*

Stay not therefore till the Leaves fall ere you remove, although they may be removed then with good success, but it is not so good at that time as before.

The ancient proverb is, *If a growing Tree you would have, Let him carry his green leaves to his grave.*

Yet notwithstanding, those that have many to *Transplant*, and cannot finish *Trees may be transplanted all the Winter.*

(or have no leasure) in this *season which is best*, they may go on, and be doing even *all Winter*, until the very Spring, unless Frost shut up the ground; And notwithstanding *Frost or Snow* all the while, if we can get into the ground, and find the mould *mellow*, so as that it will fall well between and about the Roots, it's then *good removing Trees*, although the best time is to be prefer'd.

The *time of removing* being come, and the place prepared for setting them again, then be careful in taking up the Plants, dig round about them, and take off the mould from their Roots, if it be a small plant, it may be drawn up easily, the mould being taken away; if it be great, and the Roots spread much, then they may be cut about half a yard from the body of the Plant, and the greater it is, the further off cut the Roots, and so draw it up: and break off all the leaves the first thing you do, if they be not then fallen off, for the Sun and Aire (by means of them) extract the sap of the branches.

The largest Plants not best.

And here observe; That the *Greatest Plants* are not alwayes best to transplant out of *Nurseries* into *Orchards*, though most men are for the *greatest*, when they may chuse, and they think the bigger they

are

the ſooner they will make an *Orchard*: but herein they are much miſtaken, for in removing *great trees*, there is great hazard, and many of them fail and die, and others grow very poorly, putting out only *leaves* the firſt year, or little more, though ſome few, in ſpecial good ſoyle) may do well.

Of what bigneſs to remove young Trees.

I account *young grafted Trees* fit to remove, when they are about two inches in compaſs in the body, and about *a yard and a half*, or *two yards high*; thoſe about this bigneſs, I judge to be better then ſuch as are five or ſix inches (or more) in compaſs, with a proportionable height; becauſe theſe cannot poſſibly be tranſplanted, but their Roots muſt be cut very much in the taking up, and then how can thoſe Roots (ſo much cut) be able to nouriſh ſo great a body, with ſo many branches: whereas young trees, of a ſmaller ſize, (as before I mentioned) theſe may be removed even with all their Roots, (which are young and ſmall) and may be ſpread in the earth every way, when ſet again, ſave onely the *ends of the roots*, muſt be a little cut, and theſe *young and tender roots* will ſooner ſhoot forth in the earth then the greater ſort, eſpecially (alſo) becauſe the body and branches are young and tender; the bark being thin, does more eaſily extend

: and enlarg by the rising of the sap, then the bark of *Elder Trees*. For which cause, *young trees* (when removed) do not only grow *surer*, but they also make *a larger growth* at first planting, then the *greater and older Trees* can do; and are thereore *best*.

Prune the Branches and Roots.

But if it be so that such large trees must be set, then some of the Branches must be cut, and say not as many do, here's a fair tree already, why should we cut away any part of it? But they must be content to *lose* some of the *branches*, else *they* are in *danger* to *loose* all: for removing of *great plants*, is a great check to *nature*, and if a few *roots* cut short (as they must be when *removed*) be put to feed many and large *branches*, they'l have but slender and poor *nourishment*, not sufficient many times to preserve life, much less to make a large growth.

But if *plants be of the lesser size*, you need not cut the *branches*, except such as cross one another, or grow too nigh *together*, or run up two high *without spreading*: but cut off the *ends* of the *roots* of all, because if cut, many small fibra's or strings shoot out at the *cut place*, which *draw nourishment* for the *plant*, which *without cutting would* not.

Set not Plants too deep.

Plants being thus prepared, the next thing is to set them again in the ground: take heed of setting below the good soyl.

The

The hole for the Plant being digged, and the root prepared as before, and caſt in the ſmalleſt and beſt mould next to the roots; and ſee that the ſmall mould run between all the *roots*; to that end, ſtir and raiſe the Plant, that there may not be any hollow place where the mould falls not, and with your hand draw up the upper-moſt *roots* and part them, that they may ſpread in the mould every way, and ſo fill it up.

Lay rotten dung, horſe-litter, or the like, about Trees newly ſet.

The young trees being thus ſet into the ground, and the holes filled up, it will be very advantagious to them to lay a *Barrow-full of Rotten Muck*, round about each of them, cloſe to the body of the Plant, the ſtrength whereof will ſoke in among the roots, and make the ſoyle ſpecial good, whereby the Trees will thrive the better: Or elſe to lay (inſtead thereof) ſtore of *Weeds, Litter, Ferne*, or the like, two or three handfulls thick, this will keep the roots *warm* all *Winter*, and *moiſt* and *cool* in the *Summer* following, and makes the ſoyle fatter, and alſo preſerves the Trees from weeds growing about them.

Trees thus ordered (by laying ſtuff about their *roots*) may be ſet very *ſhallow*, and thereby will be much advantaged, and grow better then ſuch as are ſet deep, be-

because in the top of the earth is the best mould, and also every shower of rain refreshes the Roots and feeds them.

If the Plants are faire large Plants, and in danger to be shaken by the winds, then knock down a stake close to every one, and tye the Plant to it with a *hay band*, or some other soft *band*.

How to prepare trees for carriage

If young Trees are to be carried many Miles to be *Planted*, then (being taken up carefully) lay the Roots all one way, the smallest and tenderest in the middle of the bundle, and bind them close from the roots to their tops, with a soft band, and then stuffe the roots round about with *straw*, *hay*, *moss*, or the like, afterward bind the bundle all over, from the roots to the very tops, with *hay*, or *straw band*, or something else, to preserve them from bruising; and withal, wrap something about the Roots, within *Mat*, or *a piece of an old sack-cloth*, or any thing that will preserve the Roots from the Wind, and Sun, and from bruising: And they may be carried many hundred Miles (if need be) in *Winter*, without hurt.

Distance of setting.

As concerning distance in setting young Trees, I conceive 8. or 10. *yards* is little enough between *Apple-trees* and *Pear-trees* in ordinary soyle, yet *Pear-trees* need not be

planted so far asunder, as *Apple-trees*. And if men have ground enough to plant, and good soyle, I should rather prescribe to Plant them 14 or 16 *yards asunder*; for both Trees and Fruits have many great advantages, if planted a good distance one from another.

Such are freed from frettings and galls, that happens to Trees that thrust, and crowd one another, whereby not only the *Buds, Blossomes*, and *Fruits*, are rub'd and broken off, but also sometimes the Barke thereby *breeds* and *destroys boughs*, and *branches*. *The 1 Advantage.*

Secondly, (when Trees are planted a due distance asunder) the Sun refreshes every Tree, the *Roots, Body, and Branches*, and the *Blossomes* and *Fruits*, whereby Trees bring forth *more fruits*, and those *fairer and better*. *The 2 Advantage.*

Thirdly, If *Apple-trees* and *Pear-trees* be planted at a large distance, much profit may be made of the ground, under and about the Trees. Ye may plant *Gooseberries, Rasberries, Currans, Strawberries, Roses, Flowers*, and all sorts of *Garden-stuffe*, commodious as well for sale, as housekeeping, which cannot be if Trees be *planted near together*, as the custome is in most places, the ground being cold and shady *The 3 Advantage.*

by

by the Trees. Besides the Trees would have advantage by frequent digging and stirring the earth about their Roots from time to time in setting these things.

The 4 Advantage.

Fourthly, When Trees have room to spread as before, they will grow very *large and great*, and the consequences of that will be, not only *multitudes of Fruit*, but also *long lasting*; and these two are no small *advantages*, besides all the former. And men are mistaken, when they say, *The more Trees in an Orchard, the more Fruit*; for one or two faire large Trees, which have room to spread, will bear more fruit then six or ten (it may be) of those that grow near *together*, and *crow'd one another*.

Let men but observe, and take notice of some *Apple-trees* that grow a great distance from other Trees, (and have room enough to spread both in the Roots and Branches) and they shall see that one of those Trees (being come to full growth) hath a *larger head, and more boughs and branches*, then (it may be) 4 or 6 or more of those which grow near together, although of the same age.

Yea, I advise if men have ground enough, to Plant *Apple-trees* 20 *yards asunder*; Now Trees so planted, will not reach of a long time, if ever, therefore much

profit may be made of Trees Plan-
between, for many years, which may
when they begin to reach one another)
taken away, and disposed of for the best
advantage to Plant abroad in the Fields.

It is a very great, and almost a general
error, the *Planting of Fruit-trees too near*
together, especially as to *Apple-trees* and
Pear-trees, as for standard *Cherry-trees*,
Plum-trees, and the like, they need not be
planted half the distance I speak off, 5 or
6 *yards in distance* is usually enough, and 7
or 8 *yards*, if the ground be special good:
for all Trees grow much larger in some
places, *then in other*.

As concerning the distance of *Wal trees*, they may be planted, 2, 3, 4, 6, or more yards asunder; More or less, according to the nature of the *Trees and soyle*. *Distance of Wal-trees.*

For *Aprecots*, and some other kinds of Trees, grow much larger then some other Trees: some *Aprecot-trees* in good soyle will spread 7 or 8 yards wide, or more; whereas the *May Cherry-tree*, is but small, at biggest; (it may be) 2 yards wide, or scarce above 3.

It is the custome (of late); to make *Cherry-hedges in Gardens and Orchards*; and *hedges* of *Quodlings*, *Nurs-gardens*, *Plums*, *Vines*, and such like Trees, that may *Cherry-hedges, and of Quodlings. Vines, &c.*

may be kept (by cutting and plaiting the branch within another) from growing very large: These are usually made along the side of *walks*, or round about a *Garden-plot*, and such a hedg is a very great Ornament to a *Garden*, being ordered and kept handsomely: Now Trees set to this purpose need the least distance of any other, a yard asunder, or an *Ell*, or more or less according to the bigness, and spreading of the young trees; for these should meet (or near it) the first year; which should be ordered thus.

Distance of Trees in a Cherryhedg

How to set and order a Cherryhedg or of Quicksets, &c.

Stretch a line from one end to the other, where the hedge is to be made, and set the Trees straight at the distance aforesaid:

Or its (in some respects) best to let the staking, and boling of it alone until the spring. The stakes and Rods (if done then) will be fresh all Sommer.

Afterwards, knock down a stake between each Tree, then having straight long Rods, or Poles of Ash, or the like, tye a row of them along from one end to the other, (about a foot from the ground) fast to the stakes with Osiers, or such like, or else nail them, which is better; and another row of Rods a foot above them, and so a third (if need be) according to the height of the young Plants; having thus done, spread and tye the branches and twigs of the Trees (in order) to the Poles, but not too hard, and draw, and

fasten

some of them down close to the ground, that so there may be blossomes and fruit from the bottome to the top, which will be a most beautiful sight to behold in Spring and Sommer: then after a few years, the *Stakes and Poles* may be taken away, and the branches platted and woven one within another, from year to year, and the superfluous ones cut off.

Yet, notwithstanding what hath been said for a more then *ordinary distance* between *Apple-trees, and Pear-trees*; this may be said for *neerness of setting*; That it is best for present profit; for if *Apple-trees, Pear-trees, &c.* be set 4 or 5 yards asunder, there will be room enough for them for divers years, perhaps it may be a dozen, or 20 years ere they meet, and all that time a man have the fruits of them, and then when they meet, he may (and it will be best to) cut down each other: or (if they be not too great) to remove them to some other place. These Trees are the best to be set at large in Pastures and other Field-lands: taken up with large roots and disbranched; and set with 3 or 4 stakes about them, that Cattle rub not upon them. And although they be for nothing but the fire, yet for that they will be more worth then they cost at first, and

Neerness best in some respects.

and all the fruits they have born to the time, are superadded: as for standard Cherry-trees, 4 or 5 yards distance is convenient.

As for those who have but *small quantities of ground to plant*, it will be most profitable to plant *near together*, as may conveniently be, not onely for the advantage of the *quantity of fruit* of each other tree which may afterwards be taken away, but also, that they may have variety of fruits, even in a small compass of ground. But those that have room enough, I say (as before) let the Trees be Planted at a *large distance* one from another, for the Reasons alledged, pag. 65.

Order in setting trees Concerning *Order* in setting Trees, though it be not essential to a good Orchard, yet if men stand upon it, they may measure out a square plot of *ground* (more or less) by a line, and then measure the distance that must be between every tree according to the *kinds* that are to be planted, and according to the *goodness*, or nature of the soyle as hath been said. And having measured exactly the *square plot*, and the distance of the Trees, set a stake or pole in the place where every tree must stand, and dig the soile round about it, a foot deep, and three foot broad, then set the

corners firſt, then fill up the *ſquare* on all the four ſides with plants, or- as before, and ſo go on to fill up all other places in the Plot exactly by the or by the eye, if there be four or five to aſſiſt in the work. And by this the Trees will ſtand in Rowes e- way. This ſquare once planted, but ſmall at firſt, may be enlarged way as the ground permits, or elſe Orchard may be drawn out in length, yet the Trees ſtand in a right line e- way by this means; and if the Trees ſet at a great diſtance, one may be in the midſt, at equal diſtance each one in the *Quincunx*.

In ſetting all ſorts of Trees, conſider *A ſpecial Rule in tranſplanting.* ſoyle they come out of, whether a and forced ſoyle, (as divers of the *Nur-* about *London*) or ſome ordinary na- ſoyle. If they come out of very ground, then procure as good or if it may be had, (though but a) to lay next to their *roots* when they ſet again.

Weeds, *Dung*, and ſuch like, laid on a will become good mould in a ſhort but ſuch heaps lying together divers ſ, are then ſpecial mould for the *roots* young Trees at their firſt ſetting.

This should alwayes be observed, *To plant Trees in as good or better soyle, being removed, as that out of which they were taken.* For every thing in nature, advanced to the better, it is grateful and beneficial to it, but if it be carried to the worse, it is a check and repulse to nature; and such a one as that, if it be in any great degree, it either much weakens it, or quite destroys it. Therefore chuse Trees not of poor soiles, but if they must be had out of rich soiles, then be sure to procure soile (more or less) of as good, or better than that out of which they are removed, to lay to their Roots, when set again.

For want of observing this course, many hundreds of good plants have been lost from time to time. The ordering of *young Plants*, the *first and second year* of *planting*, has an influence upon them many years, which if neglected then, the labour and diligence of many years after, cannot countervaile it; the ordering of Cattle while they are young, either makes or marrs them; so of Trees, and other things in some proportion; but after they have well taken Root the first and second year, they will then grow in ordinary soiles, the great danger is at first planting.

Wall-trees. Concerning *Wall-trees*: the *Apricot*, *Peach*

...ch, Nectarine, Vine-tree, &c. these and ...ch choice fruits, must be planted upon ...South-wall, if it may be: The best next ...that, I account the *East-wall*, and the *West* ...so good, on the *North-wall*, fruits will ...be late ripe; thence they may be got when ...others are gone. So that its best to plant ...the *North-wall*, not onely to have fruits ...thence late ripe, but also for the beauty, ...and comelineſs of the Garden, all the walls ...being covered with fruit-trees.

These trees being ſet, (as before is ſaid) ...they muſt be plaiſht, or ſpread upon the ...Wall, being young, (and ſo from year to ...year as they grow greater) with *Nails and Leathers*. And as they grow larger, cut ...off the utmoſt ſides or top branches, un-...till they be ſpread as large as they ſhould ...spread; and be ſure to lead the main and ...largeſt branches along the ſides of the ...wall both wayes, and ſuffer them not to ...ride ſtraight up, as naturally they will, but ...correct nature by art; be ſure to furniſh ...the bottom of the wall firſt.

Wall-trees muſt be pruned from year to year, firſt in *Summer*, ſecondly in *Winter*. About the end of *June*, or middle of *July*, the *Aprecot-trees* (eſpecially) will have put out many large ſhoots, ſome of which muſt be cut off, and others ſpread up to *Prune Wall-trees.*

the wall, where there is room for them. Tye up as many as you can conveniently with *Leathers and Nails*, and cut the rest off, which will not so well spread to the Wall; and spread the branches as that the fruits (which by that time will be growen towards their bigness) may have the Sun to refresh and ripen them, but yet pluck not off the *leaves* as some do, for if a hot time come after, the Sun may even spoile the Fruits.

1. *In Sommer.*

2. *In Winter.*

Secondly, So soon as the leaves are fallen off, the branches that cross one another, or are not well placed, must be rectified; or any of the great boughs which are growen old, and have but few small branches upon them, may be cut off, which must not be cut off in *Sommer* time, least that too great and sudden obstruction of Sap kill the whole *Tree*. But the cutting of the small *branches* in *Sommer*, is some small check and stop to the Sap, and hinders the excessive rising of it at that time, which else would spend it self *in large superfluous branches*, and so rob the fruits.

This *Winter Pruning*, is chiefly for the well-ordering of the *branches* that could not be well placed (by reason of the *fruit* and *leaves*) in *Sommer-time*, and for the cutting off of great *branches*, when need is.

It

It is a great errour amongst some, who suffer all the *young* and large *shoots* to grow as much as they will, all *Summer* without cutting, and then in *Winter* they usually cut all, or most of them quite off from the trees, and preserve only the old stumps, or biggest branches of the Trees, and by this means in the middle part of the Tree, and near the Root, there are few, or no *young branches* to be seen; Whereas they should preserve all the *young branches* to spread against the Wall, until it be full of small boughs. And then some *young shoots* every year, may be cut off as before. *Errour in Pruning.*

And in cutting away branches, be sure to take those away that grow the straighter out, and will not so easily be bowed to the wall as the other: And preserve *branches* as low, and as near the ground as may be, and cause them to bend, and grow *strait* along the sides of the wall both ways; and suffer not the biggest *branches* to rise right upward, as commonly most do, but nail them downwards, to furnish the bottome of the Wall. *Observation in Pruning.*

As for *great Trees* in the *Orchards, Fields, Hedges, &c.* they must be *Pruned* from year to year, as need is, in *October, November*, or afterwards observe to cut off the *superfluous branches*, such as *Pruning old Standard-trees.*

croft one another, and such as grow too close, so as the Sun cannot well come between the *bearing branches*: Leave no *dead Twigs* or *Branches*, and scrape off the *Moss* that is upon the *Body and great Branches*.

Ordering the Roots of old Trees.

Opening the Roots once in two or three years is profitable to some Trees, especially such as grow upon *dry* and *barren* grounds. In *November* (or there abouts) take away the Earth round about the Roots a yard broad or more, and so leave the Roots bare and open all Winter; that the *Rain, Snow, beams of the Sun, &c.* may refresh the bottome Roots, and make the ground be sweet. At *Spring* fill up the hole again with some good fresh mould, or rotten muck, to feed and refresh the Trees. In blossoming and knitting time water the Trees, (especially those on dry ground) this makes them hold their Fruit the better.

So also of *Lees of Wine*, the *washing of strong Beer-barrels*, *Blood of Cattle*, *dead Dogs*, *Carrion*, or the like, laid, or put to the *Roots of Trees*, when opened (as before) is found very profitable unto fruit-bearing, and exceedingly revives old decaying Trees.

And it is very necessary (in order to the thriving, and well bearing of Fruit-

tree)

...) that they have some *good fresh* ...*mold* or *soyle* laid to their Roots once in ... or four years, except they grow in ...*cial good ground*: for great and large ...rees, do suck and draw the fertility of ... ground exceedingly: such *great and ...dies* cannot be nourished to thrive ...ell, with a little; therefore help them ... they have need: it may be perceived ...en they have need by the *poorness* of ...*ir shoots* and *fruits*.

... opening them, and putting in soyle ...good; so also take a *Bar of Iron* (in ...*ter* time) and make many *holes* among ...*ir* Roots, and poure in *Beasts blood*, *wash-...s of Beer-vessels*, *Fat-water*, or the like: ...ese very much refresh the Trees.

But in case the *soyle* about the Roots *be over fat* and *fertil*, this may hinder *bearing*, for it will cause Trees to shoot forth *great large shoots*, and to send forth *broad leaves*, and but *little fruit*: if so, then take away some of the *fertil soyle*, and put in instead, *sand* or *cole-ashes*, or any *stuff* that is *barren*, that it may dry up, and abate some of the *too full feeding* that the Trees had, and so cause fruitfulness. Though *meat* and *drink* be never so good and *wholesome*, yet *excess burts* the body.

Abate the over-fatness of soyle.

And further observe: That *Mowing of*

Pasturing Orchards, better then Mowing.

grounds yearly, where *Fruit-trees* grow is exceeding *prejudicial to Trees* (unless the *soyle* be very *fertile*). But *pasturing of Orchards* and *Grounds where Fruit-trees* grow, is observed to be of great advantage to their prospering, and bearing fruits. When *Cattle* are suffered to lie and Pasture under and about the Trees, they much benefit the *Roots* by their warmth in sitting, and by their *soyle*, which soaks down among the *Roots*, and is a great refreshing to them, as hath been found by clear *Experience*.

Therefore permit *Cattle* (if it may be convenient) to lie and Pasture, under and among *Fruit-trees*, (after they are grown strong, and out of their reach) save only at those seasons when Fruits are ripe, because rubbing against the *Trees*, would shake down the Fruits, and spoile them. And it were better they did not rub against the *Trees* at any time, for in that respect they may do hurt, therefore set *stakes or posts* about the *Trees* for the *Cattle* to rub against, whereby the *Trees* may be preserved.

Concerning *Transplanting*, *Pruning*, and *ordering the Roots of Trees*, thus much. See further, *Errors in Practise*.

Di-

Diſeaſes Incident to Fruit-trees.

Fruit-trees are ſubject to divers *Diſeaſes* *Baptiſt. Port.* ſayes, *Affliguntur omnes, veluti Animalia, diverſis mor-* All *Trees or Plants* are afflicted with *Diſeaſes* as ſenſible creatures. And therefore we ſhould apply our ſelves to cure them, not for pity to the Trees (as indulgent compaſſionate *Manichees*) but for our own profit.

De cultu & inſit. l. c. 35.

I ſhall (at preſent) mention only four *diſeaſes* that ſometimes happen to Fruit-trees, *Moſſineſs, Bark-bound, Canker, and*

I. *Moſſineſs.*

Concerning *Moſſineſs* of *Fruit-trees*, the way to cure that (and other diſeaſes) is to take away the *Cauſe*, *ſublatâ cauſâ, tollitur* if the Spring be ſtopt, the ſtreams cannot runne. Some to cure this, onely ſcrape off the *Moſs*, not endeavouring to take away the *Cauſe*, ſo that in few years they are as bad again; that's but poor endeavours for cure of the *Tooth-ach* or *Gout*, or the like, with ſome outward applications, which, though they may give ſome eaſe for a while, yet they ſtrike not at the Root, they remove not the *Cauſe*,

Cauſe, and therefore they returne ag
So that it muſt be conſidered what
Cauſe of Moſſineſs is, ſometimes it is cau
by *over coldneſs* of the ground, as in w
riſh and clay grounds, likewiſe by *Barr*
neſs of the ſoyle.

If it be *Coldneſs* through moyſture,
uſe all means to lay it dryer, by trench
the ground: or if it be clay ground,
bring in ſome warmer ſoyles to mix w
le, as *Sand*, *Aſhes*, *Sheeps-dung*, *Pigeon*
Mens-dung, or the like: If the *ſoyle* be
barren, then help it by mixture of g
ſoyles round about the Roots.

But withal, take away the *Moſs* th
already upon the Trees, in this manne
after Raine, rub it off with a *Haire-cl*
elſe ſcrape it off with a piece of hard
in the form of a knife.

2. *Bark-bound* Another is the *Bark-bound diſeaſe*: T
exceedingly hinders the growth of *Tre*
it makes them live lingringly and poo
This happens, when there is but a
and ſlow paſſage up of ſap, and in ſ
quantity, either by reaſon of barren
of ſoyle, or want of due culture to
Branches, therefore if the ſoyle be barr
it muſt be mended, and likewiſe ſome
the branches cut off, and the reſt ſco
down all along to the *Root*, through
ba

on each side, with some *cross cuts* and in the *bark*: let this be done in the time, and the Sap will arise more fully.

other disease is the *Canker*, natural me, but accidentally hapening to o- by bruises, *&c.* This hurts many, boils some. To cure it, cut it out, if upon the body, or great boughs of and wash the place with Cow-dung rine mixt; and then cover the place clay mixed with Horse-dung, and the small branches that are dead, thal, endeavour to stop the *foun- and cause of it*, (being a sharp and vi- sap) by laying *Cole ashes, or ashes of wood, Nettles, Ferne*, and such like bles, to the roots; but if the Trees upon gravel ground, they'l hardly rd without altering the soile in a measure.

3 *Canker.*

me Trees are hurt with small *worms* reed between the *bark* and the *wood*; cause the Bark (in that part) to rise well sometimes: this being perceiv- *worms* must be cut out, and the *place* ed with Urin and Cow-dung.

4. *Worms.*

condly, concerning *Mischiefs inci- to Fruits*: by *Caterpillers, Ants, Ear- Snails, Wasps, Birds, and cold, and Winds*,

2 *Mischiefs incident to fruits.*

In

1 *Caterpillars* In the Spring-time, *Caterpillars* br (and devour many buds, blossomes, young fruits, especially in a dry seaso of the *Dew* and *Leaves* (at one says) w the *East-wind* blow's much, which cau that moist and slimy matter to vivifie breed also (as is observed) of the *Eg of Butterflies*. Now how to destroy th I know no better way then to pluck those leaves which have the *Cobwebs* m upon them, (in which they breed) tread them under foot, for one of th contains multitudes.

L. Bac. nat. hist. p. 148.

And for those that escape, being the Trees, some smoake them with st or such like, which makes them fall They may be destroyed also by squir water up into the Trees among boughs, which washeth them off.

2 *Ants.* Secondly, *Ants and Pismires* hurt fru multitudes creep up into some Trees, eat the fruits. Therefore seek out th hils where they breed and lie, and po in *scalding water* among them till they destroyed.

Yea, sometimes they be under, or n the roots of Trees, and do very great h and almost kill some Trees, those must dig'd out, and destroyed by hot water, some other way.

Also

anoint the bottom of the Trees
the Root with *Tar* round about, that
these little Thieves may be taken Pri-
ers by sticking in it.

Thirdly, Fruits (growing ripe) are 3
sometimes eaten with *Earwigs*. One *Earwigs.*
to destroy them, is by setting Oxe-
Canes, or any hollow thing near
Roots of the Trees, and among the
upon the ends of sticks, and they'l
in, and lie there, then take off these
quickly, and shake them into a boule
ater, or crush them with your foot
the ground.

These Creatures do most mischiefe to
trees, especially upon old walls. Pick 4
off betime in the morning, and de- *Snailes.*
them. But if you keep the wall well
ted with lime, that they have no har-
there, and the Roots clean from
eds you'l not be much troubled with
em.

To keep them from some choice Trees
Fruits, strew ashes round about.

Another *mischief* incident to fruit, is by 5
Wasps and Hornets sometimes; some find *Wasps.*
their nests, and are so bold as to de-
oy them there by scalding water, or
me other way. Another way to de-
oy them, is by hanging Earthen Pots
half

half full of water in Trees, dawbed in
inner ſide with *hony*, & they will leave
fruits, and fall to the honey, and hav
ſuckt of it, they fall into the water
periſh. This way deſtroyes multitude

6 *Birds.* *Birds* alſo ſpoile *buds and fruits*:
Bulfinch and *Linnet*, in the Winter t
and Spring, eat up multitudes of *bud*
Cherry-trees, *Aprecot-trees*, and *Plum-tr*
which are prepared for *bloſſoms* and *fr*
and being ripe, they peck and eat ma
you may deſtroy them, by ſetting
twigs (with baits) in the Trees, and
ſome with a Croſs-bow, and hang the
in the Trees. And *Clack-Mills* may
ſet in divers places in the Orchard, wh
will affright them: alſo bruiſe *Rats*
very ſmall, and mix it with *Oatmeal*,
lay it in ſmall percells in divers places,
the birds eating of it will die. This
ſure way to kill many.

7 *Winds.* But the greateſt *miſchief* incident
fruits, is by *cold winds*: and *Frosts in th*
Spring time, and by ſtrong winds in Sum
and Autumne: which ſhake off the fru
againſt the hurt of *cold winds*, and *fr*
Wall-trees may be covered for a certa
time while they are knitting (being e
ceeding tender) and great ſtandard Tre
may be ſmoaked in knitting time, ſer

fire ſome moiſt ſtraw, (or any thing that will make a ſmoak) under and among the Trees.

Likewiſe, Plant ſuch Trees as will grow high upon the *North or Eaſt*, that may be a good ſhelter continually againſt theſe cold winds, which is the beſt courſe: the Orchard muſt be defended (if it be poſſible) with ſome high Trees on the *North*, *Eaſt*, and *Weſt* ſides, or ſo planted, that they may have houſes, hills, or ſomething elſe, to break off theſe *winds* from the *Fruit-trees*.

So much concerning *Diſeaſes and Miſchiefs*, incident to *Fruit-trees, and Fruits: with their Cures and Remedies.*

The

The Alimental and Physical use of Fruits.

FRuit-trees being Planted, and duly ordered to Fruit-bearing, then come the joyful Harvest, the *End* of all our labours; then we make use of *Fruits* as may be most for our profit: I shall speak of the *use of Fruits*, in respect both of their *Alimental* and *Physical use*.

First concerning the use of Apples.

Of Apples. When *Apples* are ready, they may be disposed of divers ways, some for *Cider*, others for sale, others for daily dishes to the Table, ordered many ways.

Apples best for Cider. Some prefer one sort, as best for *Cider*, and some another: In *Herefordshire*, and some other parts, the *Redstreak* is generally prefer'd for *Cider*, before *Pippins*, *Pearmains*, or any other kinds: yet some others, prefer *Pippins*, *Pearmains*, *Gilliflower-Apples*, as best for *Cider*, as having in them a more *Cordial juice* then other *Apples*: And some differ from these, and

the *Apples* known by the name of ... make the best *Cider*, and call it ... *Sack of Cider*: Others cry up the ... *Apple*, as best of all for *Cider*.

I shall not stand to dispute which is best for *Cider*; but seeing they are all so good, that an *Argument* is raised, which are best for *Cider*? My advice therefore is, that men propagate, and increase great store of Trees of all these kinds, and other sorts of Fruits, which (by experience) are found to be good for *Cider*: And then every man may take where he likes, and please his Palate, with that that suits best with it. *Increase the best kinds for Cider.*

But without doubt, the *Redstreak* (which is a kind of *Wilding*, and somewhat hard and briske) and generally all hard *Apples* and *Wildings*, which have a lively, pert, brisk juice, (so that they come not too near the degree of stark Crabs) all these kinds, I say, make excellent *Cider*, which experience shews, and confirms from year to year.

Cider made of *hard, harsh fruits*, is not so soon ready for drinking, as that of *soft fruits*, and those more pleasant: That made of *Table-fruit*, being earliest ripe, is ready to drink, even so soon as its well setled and cleared; but that of hard *Apples*, *Some Cider sooner ready then other kinds.*

not till *Sommer* following, and will continue good for two or three years, or longer: and if well kept in good vessels, well stopt, and in a good cool Celler, will somewhat improve in keeping.

How to make Cider and Perry.

Now, for the making of these Liquors of *Cider* and *Perry*, I shall onely mention it briefly, for their sakes that know it not; Some have *Cider-Mills* on purpose, wherein they grind the *Apples*, as *Tanners* do their Bark, and then bring them to the Press; others Pownd them in Trough, till they be small; it comes all to one: The Liquor being strained out, carry it to the Vessels prepared for that purpose, and runne it up: The Vessel being full, let it rest certain days, till the Barme begin to fall, then put in a handful of *Bay-salt* (that makes it draw fresh, even to the bottome) so stop it up very close with a *Cork*, yet leave a little Vent-hole in the top near the Tunhole, with a peg in it, and once in a day or two, give vent there, while it ferments, and works strongly, lest it break the Vessel: afterwards stop up the Vent-hole very close also.

Then mix Clay and Bay-salt together, and lay it upon, and round about the Tunhole.

Then mix *Clay* and *Bay-salt* together, and lay it upon, and round about the Tunhole, that so no Aire may get in, nor Spirits of the Liquor get out; make the *Clay* hollow

hollow in the midst, and lay on it some Bay salt, this keeps it moist all Sommer, otherwise it may chap, and let in Aire, to the prejudice of the Liquor; the close stopping of Vessels, is of great advantage to the *Cider*.

When *Cider* is well cleared, towards the *Spring*, (and so afterwards) some may be *Bottled*, if we would improve it to the utmost: *Stone-bottles*, or *Glass-bottles*, both are good, into each *bottle*, put a quantity, (more or less, as each one pleaseth) of *white lump sugar*, which I prefer before *Lose-sugar*, it being sophisticated with *Lime*, *Allome*, and other things) then fill the *bottle* with the Liquor, yet not altogether full, but let be the space of an inch or two between the Liquor and the Cork: then Cork it well; let not the Cork be too little, so as to go in easily; but take a full Cork, that must be knockt in about half way: for the *well Corking* of *bottles*, (though the direction may seem trivial) is of great concernment to the goodness of the Liquor. *Of botling of Cider.*

The liquor being thus well Botled, may be kept in several places, either in *Gravel* or *Sand*, in a Celler up to the neck, and some may be sunk down into water, in some secure, convenient place; or other- *How to keep bottels of Cider.*

wise to keep them cool, and exclude the Aire, especially in the heat of *Sommer*. And in this season, let the Corks be *bound* down close with a Packthred, else some of them will be thrown out by the liquor, especially if they be carried abroad, or laid in a Chamber where the Aire is warm.

Many things more might be said concerning the ordering of *Cider*, according to several mens *opinions* and *experiences*: these things (briefly mentioned) are *plain* and *practical*, and comprehend many other *particulars*.

Of the healthfulness of Cider.

Cider that is made of good Fruits, and well ordered, is the most *wholesome drink*, and so it is accounted by *Learned and Judicious Physitians*, they do much magnifie *Syrupum de Pomis*, the juice of Apples. See *London Dispensatory*: composed by a whole *Colledg of Physitians*, pag. 38.

Julius Palmarius lib. de morbis. pag. 248.

A Famous *Physitian* in his time, gives it this Commendation; *Pomaceum e succo Malorum dulcium, quæ maturitatem consequuta sunt, satis defecatum, maturum, tenue, subflavum melancholicis adeò salubre est, & omne Potionis genus bonitate vincat*: That is, *Cider of pleasant Apples, which are full Ripe, being well setled, cleared, and fermented, is the most wholesome drink for melancholick*

melancholick persons; and excels all other Liquors in goodness.

And the *Cider of Pippins*, and *Pearmains* is most commended by some, as containing in them more of the *Balsamum* of nature, then other Apples; *Et humidum radicale oleosum, spiritus vitalis vigore impregnatum*: preserving the radical moisture, and vital spirits of the body, which does singularly preserve health, *Ad extremum usque senium*, to very old Age.

Secondly, As *Learned Physitians* do approve of it, for the *most wholesome drink*; so also *experience* speaks, and proves the same, not only of many persons, but even of many Generations, in *Hereford-shire*, *Worcester-shire*, and other *Fruit Countries*, where it hath been, and is of continual use.

Thirdly, And besides the *Opinion and Judgment of Physitians* herein, and continual *experience* in the use of it for many years; this also is a convincing Argument thereof.

God hath been pleased in his *Wisdom*, *Bounty*, and *Goodness* to mankind, to *create*, and give such *Commodities* in every *Country and Nation* as are *most useful*, and *best* for the Inhabitants of each particular *Clymate*: for instance, in *Spain*, *Italy*, and

those hot Countries, they have *Oringes*, *Lemmons*, and *Pome-Citrons*, which have in them the most cool refreshing Juice, and Liquor of any Fruits, which are most necessary, for the cooling and refreshing the *Blood*, *Spirits*, and *Bodies* of the Inhabitants.

And in the *Northerne cold Countries*, God hath given them great store of *Coles* and *Wood*, for Fuel, which is not in so great plenty in better Countries: So also for *Fruit-trees*; some parts of *Worcester-shire*, *Glocester-shire*, &c. The ground does naturally bring forth *Fruit trees*, (besides the labour and diligence of men in Planting) the soyle is naturally fit to receive, cherish, & increase all sorts of *Apple-trees*, *Pear-trees*, &c. which bring forth abundance of Fruits, whereof to make this wholsome and best drink, *Cider* and *Perry*. And *England* affords the greatest store of *Apples*, and the best of any other Country; which is an Argument (I say) of the *profitableness*, and *healthfulness of this Liquor*, for the *Inhabitants* of these *Climates*.

So then, if *health* and *long life*, be in esteem with men, they must needs also value *this means thereof*; the *seasonable and moderate use of Cider*, and consequently *Fruit-trees*, and the works and labours

about

about them, as conducing to those great and desirable ends.

Before you gather *Apples* to keep, let them be ripe, which may be known by the *colour*, and by the *seed*; cut some of them, and if the seed be turned *brown*, or somewhat *black*, such may be gathered; gather them in a dry day, pull them one by one, and put them into Baskets lined with Woollen cloath, that they bruise not. Carry them into a loft, or upper Chamber, and lay them on *Mats* or *Boards*, not on *Plaister* or *Clay floors*, *they will be moist*. Lay them thin, not on heaps as some do; let the windows and holes be open, especially upon the *North-side*, in dry dayes, that the Aire and Winds may dry up their superfluous moysture. Lay every kind by themselves, and pick out all the leaves, and such as rot, from time to time. Turne them sometimes, and in *Frost*, cover them with *Mats*, *Straw*, or the like. *How to keep Apples.*

If *Apples* offend any through wind, eat with them *Ginger*, or other *hot Spices*, or *Carroway-seeds*, *Fennel-seeds*, or the like. So *Dodonæus*: *Quorum malignitas vel aromatis, vel aliis corrigi potest.* *Hist. stirp. l. 3. p. 797.*

Apples are prepared for the Table, all the year long, many wayes, (I shall not need to speak of particulars) and

are pleasant and healthful to the body

Dodon. hist. l. 3. pag. ibid.

Dulcia poma minus frigida sunt ac humida, alimentum conferunt amplius quam cetera poma. He sayes, pleasant Apples are less cold and moist, and afford more nourishment then others.

Concerning their Physical Use.

Deliment. facul. l. 2. p. 20.

Galen ascribes heat to some kind of *Apples*, he speaks of their *Physical propertie*, in relaxing the belly, and sayes, the *acid & acrid* perform this: but with some difference. *Hæc cum calefactione, Illa autem cum refrigeratione.* The *Acrid* doth with heat, the other with cold. Sweet *Apples* relax the belly more then other kinds. A good Author says, every sweet thing detergeth and relaxeth; and therefore *Pears* (which are generally more sweet then *Apples*) loosen the body more then *Apples*.

D. Alim facult. l. 2, l. 2. c. 569.

Apples also help Concoction. So *Galen*, *Post cibum, statim, dare ipsa, &c.* taken after meat. *Nonnunquam autem cum pane, ad ventriculum & stomachum roborandum,* eaten with bread, they strengthen the stomack. So *Avicen*: *confortant debilitatem stomachi.*

Galen says, pleasant *Apples* are profitable

table in hot diseases. *Sæpe in morbis affectus præsidium:* So Matth: *Pomum coctum non solum sanis competit, sed etiam ægris:* He says they are Cordial to persons in hot diseases: *Calidis cordis affectibus succurrunt.* Being rosted, and eaten with *Rosewater* and *Sugar:* and that the pleasanter kinds are helpful against *Melancholy*, and are good against the *Plurisie*, if roasted and eaten *Glycyrrhizæ succo, & sacchero, mirifice juvant.* : With juice of Liquorice and Sugar, morning and evening, two hours before meat, they wonderfully help. In Com. pr. l. Diolcor.

Observe one special *Physical propertie* more of *Apples*, set down by a Learned and Experienced Author. These be his words.

The pulp of rosted Apples, four or five (if Pomewaters) mixed in a wine quart of faire water, laboured together, and drunk at night last, within an hour, doth in one night cure those that piss by drops, with great anguish and dolour; the Strangury, and all other diseases, proceeding of the difficulty of making water, but in twice taking, it never faileth in any: also the running of the Reines: which I have often proved, and gained thereby both Crownes and Credit. So the Author. Ger. Herb. pag. 1270.

Con-

Of Pears. (a) Lib. 2. de aliment. fa. p. 20.

Concerning *Pears*: (a) *Gallen* sa[illegible] they have like properties with *Ap*[illegible] and what is said of *Apples*, if we attrib[illegible] the same to *Pears*, there needs noth[illegible] anew to be said of them. *Quæ de M*[illegible] *diximus, si ad Pira transtuleris, nihil* [illegible] *quod nos de ipsis novum dicere oportet.*

(b) Lib. 2. ch. 548. (c) Hist. stirp. 3.

(b) *Avicen* says, *Sedant Choleram*, th[illegible] mitigate Choler. (c) *Dodonæus* co[illegible] mends them above *Apples*, for their [illegible] rishing propertie: *Alimenta Pira omn*[illegible] *amplius & copiosius, quam Mala confer*[illegible]

* Lib. 2. Ch. 548.

So * *Avicen*; *Humor eorum plurim*[illegible] *& laudabilior est humore pomorum.*

Pears make an excellent *Wine*, b[illegible] well ordered. A late Author sayes, [illegible] might have *Wine of Pears*, and other [illegible] our *Fruits*, not inferior to *French Wi*[illegible]

Ma. Rust.

And another tells us, that a famous *Phy*[illegible] *sian* of his time was not content to eq[illegible] them with *Wine of Grapes*, but prefer[illegible] them before it in every thing. *Crabs*, [illegible] *Wildings*, mixt with *Pears*, make an ex[illegible] cellent Liquor, better then *Pears* alone.

I need not tell *Herefordshire*, and *Wor*[illegible] *cestershire* men, the good properties of *Pe*[illegible] *ry* and *Cider*; they know by experience [illegible] is both *Alimental* and *Physical*; that it [illegible] not only for *health*, but also for *long life*; and that *Wines* made of the best kind [illegible]

Appl[illegible]

[illegible] and *Pears*, is a special *Cordial*, [illegible] and reviving the spirits, making [illegible] heart glad, as *Wine of Grapes*.

And it has been observ'd, that those [illegible] drink *Cider* and *Perry* daily, or fre[illegible]ly, as their common drink, are gene[illegible] *healthy persons*, and *long-lived*.

And that it will begger a *Physitian*, [illegible] where *Cider* and *Perry* are of ge[illegible] use.

Quinces are special fruits, and of mani[illegible] uses, not only for daily nourishment, [illegible] also for *Physical* respects, either of [illegible]selves, or mixed with other Fruits. *Mesbiolus* commends them both for *meat* [illegible] *medicine*, boyled with hony. *Ex melle* [illegible] *& Cotoneorum carne confecta, tam* [illegible] *quàm medicamenti commodum.* *Of Quinces.* Com. in lib. Dioscor p. 201.

So *Rovilius*: And that many dainties [illegible] Banquets are prepared of them: *Mul*[illegible] *ex Cydoniis malis parata ex iis sectis &* [illegible] *in aqua elixis donec tabescant,* Hist. plant. lib. 3. pag. 290.

There are divers wayes of making [illegible] *malade of Quinces*, which is known [illegible] a good *Cordial*, strengthening the [illegible] *and Heart*, both of the sick and [illegible]

Gallen says, being made with hony, it [illegible] last seven years, and loose none of its Dealiment. facul. lib. 2. pag. 20.

its properties, *diu duret, ſi quis ipſum melle coctum aſſervare velit, poſt annum rem invenimus nihil in qualitate ſua latitat.*

Hiſt. ſtirp. lib. 3. pag. 784. *Dodoneus* ſayes, they bind ſtrongly their own nature, and ſtay Vomit *Valde aſtringunt, ventriculum roborant, vomitum ſedant.*

Quinces may be kept good a year, or (ſome have ſaid) two years, thus, put th in a Barrel, cover them with penny and once in 10 or 12 dayes draw it off ſtir not the *Quinces*, then put in freſh again from time to time, this is accounted far better then uſual *Pickle*. Othe keep them thus, boyle the Parings Cores of *Quinces*, with *Salt* and *Ging* and in this Pickle they will keep divers Months. A late Author ſayes, there Fruit in this Land of ſo manifold uſe *Quinces*.

Of Cherries De Nat. ſtirp. c. 64. lib. 1. *Cherries* are a healthful and pleaſan Fruit: *Ruelius* ſays, *Ceraſa bonum ſuccum creant*, they breed good humours in the body; ſo another, *Bonum ſanguinem generant.*

Dodoneus, accounts the *tart* and *ſour* *Cherries* beſt; *Inter Ceraſa optima ſunt acidula.*

There

There is a pleasant and refreshing *Wine*, made of *Cherries*, in Countries where they have great store, both in their Liquor lately, and the same mixed with *Grapes*. *Uvis maturis admiscentur, & deinde vinum ex his paratur gustatu gratissimum*: Doubtless *Cherry-wine* in *Sommer*, is a pleasant and healthful Liquor, more proper for that Season then hot Wines.

* I have heard it from a Gentleman of very good credit, that he drank *Cherry Wine* of above a *Twelvemonth* old, which was very good *Wine*; whereas it was thought it would not have lasted half so long; The *Morello* Cherry, and other deep coloured pleasant Cherries, will make a special good *Wine*; the Liquor of it self, or mixed with *Cider*.

Cherries boyled in brothes and drinks, give a pleasant relish, and are good for hot and feverish bodies. And in Countries where there is great store, their custome is (as is credibly reported) to eat their Breakfasts of *Bread*, *Butter*, and *Cherries*.

The *School* or *University* of *Salern*, gives them great commendations, and tells us, divers commodities they afford:

Cerasa si comedas tibi confert grandia dona,
Expurgant Stomachum, nucleus lapidem tibi tollit,
Et de carne suâ sanguis eritque bonus.

By

By eating Cherries great good doth arise
To such as use them, for the Learned wise
Say, that they purge the stomack, and bowels
The broken stones and kernels have been seen
To break the bladder-stone, breed wholsome blood,
To fat and feed the body they be good.

Another says, they increase and comfort the *Liver*, and that the tart and sharp close the mouth of the stomack, and make the better and speedier digestion.

Com. in l. 1. Dioscor p. 198.

Matthiolus says, *Omnia refrigerant, roborant, & tibi appetentiam excitant, idcirco febricitantibus, ac sitientibus, facile concedantur à medicis Germanis.*

All *Cherries* do cool, strengthen, and stir up appetite to meat, and therefore they are (as is Recorded) readily allowed by the *Germane Physitians*, to such as have severish, hot, and thirsty diseases; other Authours say the like, which for brevities sake I omit.

of Plums.

Com. in l. 1. Dios. p. 216

Matthiolus sayes, *Prunabilem dejectum, proinde ea utiliter medici ad febres, alioſque bilioſos affectus reddunt.* Plums cast out Cholerick humours, and are good in severs, and other Cholerick and hot Diseases.

A

A late Author sayes, out of *Damsons*, and other sweet *Plums*, may be made a drink not inferiour to some good *Wines*, and abundance of *Aquavitæ*.

Schol. Sal. sayes:

Infrigidant, laxant, multum prosunt tibi Prunæ.

Plums cool, and loose the belly very kindly:
No way offensive, but to health are friendly.

Many good dishes for the Table, and delicates for Banquets, are made of Plums with hony and sugar, to use all the year, and profitable both for the sick and healthful.

Of Aprecocks. De Facult. Alimen. l. 2. p. 20.

Gallen accounts *Aprecocks*, better then Peaches; *Non in ventriculo, ut illa, corrumpuntur:* because they are not so soon corrupted in the stomack. *Avicen* sayes, *Succus ficcorum confert fœbribus acutis.* The decoction of dried *Aprecocks*, is profitable in sharp feavers. *Matt.* tells us, that the *Oyle* of the *stones*, is very profitable to anoint the heat, and swelling of *Ulcers* and *Sores*, and pains *in the Ears*. And that the *Oyle* mixed with *Wine*, and drunk, drives *stones and gravel* out of the *bladder and kidneys*: and helps the *Collick*.

Can. l. 2. c. 146.

They are ordered many wayes, and all

Of Peaches. all pleasant to the body, and healthful.

L.p.80.&c. *Dioscor* sayes, *Persica mala stomacho utilia sunt, alvum quoque bonum praestant.*

L. 2. 571. Nat. Hist. p. 15. *Peaches* are good for the Stomack, and keep the belly soluble: so *Avicen, Matura sunt bona stomacho.*

L.15. c.12. & l.23.c.7. *Lonicerus* sayes, *Persica mala in ardentibus febribus sumi possunt.* *Peaches* may be eaten in burning fevers.

Pliny commends *Peaches* as much as any fruit, even for the sick, with *Wine or Vinegar*; *Poma Persica innocua expeti ægris utilioraque, cum vino aut aceto, &c.*

Peaches eaten moderately, (for so we are to use all Fruits) are no doubt profitable to cool and loosen the belly, especially for hot constitutions; but withal take the advice of

Schol. Sal.

Persica cum musto, vobis datur ordine justo.

Take a cup of Wine, or strong drink with them.

Of Mulberries. De veget, & Plant. Some make a drink of Wine of *Mulberries*, as *Albert. Magnus* tells us, *De moris fit potus, qui Moretum vocetur.* A spoonful or two of this, will colour a quart of *White Wine* or *Cider.* *Ruel* says, *Succus siccato pomo expressus, multum obsoniorum sapori confert, & miram gratiam commendat;*

[illegible] the *juice of Mulberries*, prest out and [illegible], and put into meats, gives them a [illegible] pleasant taste and relish. The *Juice* [illegible] is known by experience to be a good *remedy* for a sore mouth or throat, [illegible] as are perfectly ripe, relax the belly, [illegible] the unripe (especially dried) are said [illegible] bind exceedingly, and therefore are given to such as have *Lasks* and *Fluxes*. *Do*[illegible] sayes, they stir up a languishing ap[illegible], especially in hot bodies, *appetenti*[illegible] *calore languentem excitant*. De nat. stirp. c. 102. p. 26[illegible].

So *Avicen*: *Appetitum cibi faciunt*. They are used by *Apothecaries* for many other purposes. Cant. l. 2. c. 498.

Figs are said to nourish much, and to [illegible] store of blood. *Dodonæus* prefers them above other Fruits, in respect they nourish very much: *Alimentum amplius* [illegible] *cæteri præbent*: So *Mat. Ficus* & [illegible] *inter fructus autumnales principatum* [illegible]. *Of Figs.* Nat. Hist. l. 3. p. 800. Com. in l. pr. Dios. p. 230.

We have a sort of blew *Figs* that come to perfect ripeness in *England*, which are [illegible] (being newly gathered) with Pep[illegible], Salt, and Bread, and may be dried to [illegible] all the year. And (doubtless) nourish [illegible]dingly: Some make excellent *Tarts* [illegible] them.

Lonicerus sayes: *N*[illegible]*ram confortant*.

Dioscor, commends them as profitable to those who have lost their colour by long sickness.

Li. 23. c 7. *Figs*, according to *Pliny*, are restorative, and the best thing that they can eat, who are brought low by languishing sickness, and on the mending hand: they help (as another saves) an old continual Cough (being boyled with *Hysop*, and drunk) also *Obstructions*, and other faults of the *Lungs*. *Schol. Salern.* commends them for divers things:

Scrofa, tumor, Glandes, Ficus cataplasmata sedet.
Junge papaver ei, confracta foris tenet ossa.
Swines-Evil, Swellings, Kernels,
Figs by a Plaister cure:
Adde Poppie to't,
Then broken bones it sets them sure.

Of Medlers. Hist. stirp. l. 3 p. 789. *Condiuntur hi cum sacchare, aut melle* (as *Dodonæus*) *quo modo apparati ori et palato grati sunt.* Ordered with honey or sugar, they are acceptable and pleasant to the tast, they fortifie digestion, and preserve the humours from putrefaction. They stay vomitings and looseness of the stomack or bel[illegible] *Valentius astringunt*, *proin*[illegible]

De l. facul. l. 2. p. 21.

[illegible] ventri fluenti cibus est utilissimus: [illegible] *Gallen:* Another says, *Mespilorum os-[illegible]la in pulverem contrita calculos è renibus [illegible] pellunt.* The kernels bruised to [illegible], and drunk in liquor (especially where [illegible] roots have been steeped) do mightily drive out stones and gravel from the Kidneys.

A late Author says, *Medlers* are singular good for Women with Child, seeing they strengthen the stomack and stay the looseness thereof.

Another sayes, They are very effectual for Women with Child against abortion.

A late Author says, the profit of *Wallnuts* is infinite; They are usually eaten after meals to close up the stomack, and help digestion. And according to *Avicen*, *Recentes sunt meliores stomacho.* Bread or Bisket may be made of the meal being dried. The young Nuts pealed, are preserved, and Candied for Banqueting-stuff; and being ripe, the Kernels may be crusted over with Sugar, and kept long. *Of Walnuts.* Can. l. 2. c. 501.

Avicen sayes, *Juglans ficubus, & Rutâ medicina omnibus venenis: Wallnuts, with Figs and Rue, is a preservative against all Poison.* Can. l. 2. c. 501.

Sebil. Sal. Reckons *Wallnuts* for one of the six things that resist poyson.

Allia, Nux, Ruta, Pyra, Raphanus cum Theriaca:
Hæc sunt Antidotum contra mortale venenum.

Garlick, Rue, Pears, Radish, Treacle, and Nuts:
Take these, and then no deadly poyson hurts.

Plin. nat. hist. l. 23. c. 18.

Mithridates the great: his preservative was (as is recorded) *Two Wallnuts, two Figs, Twenty leaves of Rue, and a grain of Salt stamped together:* which taken no poyson that day could hurt him.

Green Wallnuts about Midsommer, distilled and drunk with Vinegar, are accounted a certain preservative against the Pestilence.

The milk of the Kernels (as Almond-milk) doth cool and refresh the Appetite of the languishing sick body.

So much for the *Alimental, and Physical use of Fruits.*

Errors

Errors Discovered.

Having shewed some profitable Instructions in this *Art of Planting Fruit-trees*, I think it convenient likewise to discover some *Errors* that I find both in the *Theory* and *Practise* of it, that men may take heed of them.

Let not men think that *Ancient and Learned Authors* have discovered all *Truths*: or that all they have said is *Truth*: they are but men and have their *Errors*: *Humanum est errare; quandoque bonus dormitat Homerus*, as one says, *Non est pro magno habendum quid homines senserint, sed quæ sit rei veritas.* It's not any great matter what men have thought, but what is the *Truth* of the matter. *Quid ad nos, qui potius de rebus ipsis judicare debemus?* What is it to us what men say, who ought rather to judge of the things that are spoken? *Oportet edoctum judicare*: as L. *Bacon* says. Men that are taught, must not resign up their Reason to their Teachers, but judge of what's said.

August de civ. Dei, l. 19.

Adv. of Learn. l. 1. p. 45.

Some great and Learned Authors have asserted very weak things, and altogether untrue. L. *Bacon* sayes concerning them, That the *Writings of speculative men upon*

active matter, seems to be men of experience, but are dreamers and strange. Indeed they go about to build Castles in the Aire, (as the Proverb is) for as a building cannot be set up without a foundation, so neither can effects be produced without causes. Nulla effectus datur sine causa. They tell us of many great and desirable things, but when they come to discover the causes and means, whereby they must be effected, these are (many of them) weak and childish, and which (I suppose) proceeded from them upon their first apprehensions, without weighing them in the scale of Reason, or trying of them by the Touchstone of Experience. And as the L. Bac. sayes, The high and vaporous Imaginations, instead of a laborious and sober enquiry of truth, do beget hopes and beliefs in themselves, of strange and impossible shapes.

Adv. Learn. l. 1. p. 145.

And elsewhere he sayes, The Causes and Axioms of some ancient and modern writers are so full of imagination, and so infected with old received Theories, as they are meer Inquinations, (or defilements) of experience.

Nat. Hist. p. 165.

And these he ranks amongst the discredits of Learning, he sayes, Many things have been rashly, or with little choice or judgement received, and registred, as appears in the

Advan. Lear. l. 1. p. 32.

writings of divers Authors, which are e-
where fraught with forged and fabulous
, and those not only uncertain, and un-
, but extreamly untrue, to the great de-
ation of Natural Philosophy, with grave
sober men.

shall therefore discover some of these
, as they concern this *Art of Plant-
Fruit-trees*, that inexperienced persons
not be deceived by them.

And afterwards shew some *Errors in the
ctice* of this *Art*, that they may be a-
ded.

shall divide the *Errors* in the *Theorie*
contemplative part*)* of this Art, into
ee sorts.

The first sort are, *Instructions hurtful and
ngerous.* 1

The second are, *Instructions for effecting
some things impossible to be done by the
ns prescribed: and others impossible to be
ted by any means.* 2

The third sort are, *Assigning wrong cau-
to Effects.* 3

For the first.

A late Author, giving Instructions for
ffting, says, *Graft the next Spring after
move.* 1

This, I say, is a *dangerous Instruction*,
cause *Stocks* removed, have so great a

wound and repulse by removing only, that they cannot so well bear another so soon after so great, as *Grafting* would be, if in the cleft: Therefore let stocks remove grow a year or two before *Grafting*; *Reason and Experience* is clear enough in this.

2 Secondly, *Theophrastus* giving instructions for Planting, sayes, *Nullâ radiculorum parte detractâ, stultum est enim amittere radices quas habemus, ut acquiramus novas.* Take away none of the Roots, for it is a foolish thing to loose those Roots we have, that we may get new.

This is a *hurtful and dangerous Instruction*, for except some of the small strings, and roots be cut away, if there be many, and all the ends of the great ones, they will not put forth new *Roots*, as they will if cut: and multitude of *Roots* binder the mould from closing on every side of every Root, as it ought to do, therefore some must be cut away, and the ends of all that are left; Experience proves this sufficiently.

3 Thirdly, *Columella* giving *instructions for choice of Grafts*, this is one, *surculi sint bisulci.* Let Grafts be double or forked. So *Ruelius*.

Columel. lib. de Arboribus. cap. 29.

This is a *dangerous and hurtful instruction*, because *forked*, or *double* or *treble* Grafts,

[illegible] most of them die, and those that grow poorly, not a fift or fixt part (it [illegible]) so much as *single and short grafts.*

[illegible]ly, *Bapt. Port.* giving *Instructions* [illegible] *of Grafts*, says, we must take *sur-* [illegible] *pregnantes & turgentes:* Grafts full [illegible] swelling with Sap. *This is a bad instru-* [illegible]; for *Grafts* should be taken before [illegible] swell with Sap, for it is a repulse to [illegible] to cut them after sap stirs in them: [illegible] will such take hold on the stock [illegible] as those which are indigent, and [illegible] of sap: therefore let *Grafts* be cut [illegible] the Tree, *before sap stir in them.* 4

Another says *When Grafts put forth, take* [illegible] *the Clay, for Clay rather keeps moisture* [illegible] *drought, save a little in the hole.* 5

This is a *hurtful Instruction*; for sap will [illegible] cover the head of the stock, nor close [illegible] the clefts on both sides so soon without [illegible], as with it: *Clay* is *as* a salve to a *wound*, [illegible] heals it up, and it rather keeps out [illegible]ysture, then otherwise, if well closed; [illegible] also preserves from dry *Winds*, *Sun*, [illegible] other annoyances; therefore keep on [illegible] *Clay* a year or two, till the head of the [illegible] be covered, and the Cleft healed [illegible]

Another says, *When the Grafts have well* [illegible] *forth, underprop them, else wrap them* 6

one

one within another, and tye them with w[illegible] amongst, for fear winds break them.

This is a very *hurtful and dangerous [illegible]struction*, for all these wayes do free, [illegible] gall the bark, and (it may be) breed [illegible] *Canker*: And besides, it hinders the yo[illegible] grafts that they cannot *spread* into an *ban[illegible]some* form: this course brings a certai[illegible] mischief to prevent an uncertain: wi[illegible] hurt but few, except they be very to[illegible] heavy; if so, then cut some of the bra[illegible]ches till they be grown stronger bel[illegible] able to bear the Top.

7 Some Authors counsil us to cast *glew [illegible] to the place of Grafting, to glew together [illegible] two substances, or sprinkle Sugar, Cinam[illegible] or sweet liquor, that the fruits may retain [illegible] taste.* This is a *hurtful instruction*, becau[illegible] *liquor* (or any other substance) put *betw[illegible]* the *stock* and *the graft*, do hinder (if no[illegible] spoyle) the joyning of *stock* and *graft*, b[illegible] if this might be done without hurt, eith[illegible] to stock or graft, yet would it be no wa[illegible] effectual for the *End* proposed. Of th[illegible] further, see pag. 84. *&c.*

8 A late Author sa[illegible] *Plant not against [illegible] wall, because a Tree cannot be so long lived, nor grow to the bigness it else would do.*

This is a *hurtful Instruction*, because many kinds of Fruit-trees, as the *Aprecock*, *Peach*,

[illegible], *Nectarine*, and divers other Trees, [illegible] bear little or no fruit, except they be [illegible] *against a wall*: And though it be [illegible], that Trees planted against a Wall, [illegible] be so large as if planted from the [illegible]: Yet I suppose it's better to have a [illegible] *small trees, that bear store of great fruits, [illegible] store of great Trees, that bear but a few [illegible] fruits.*

[illegible]*lumella*, giving Instructions for remo- 9
[illegible] Plants, says, *Mala æstiva, Cydonia, sori-* L. 1. de Ar.
[illegible] *prima, post mediam hyemem usque in Idus* p. 490.
[illegible] *scrito: Pyros Autumno, ante brumam* [illegible]: Plant the Sommer Apple, *Quince*, [illegible]*vice-tree*, and *Plum-tree*, after Winter, [illegible] *February*, but *Pear-trees* before Win-[illegible]

This is a hurtful instruction, as to the [illegible] part: for Trees should be planted in *Autumne*, as has been said, and there is the [illegible] Reason why the Sommer *Apple-tree*, [illegible] the rest, should be planted before [illegible]ter, as is for *Pear-trees*. See at large, [illegible] 60, &c.

One adviseth thus: *Let the Orchard be* 10
[illegible] on some Hill-top, rather then on plain grounds, for they have better Aire, and better prospects, and also contain a greater number of Trees then plain grounds.

This is no good Instruction; for Orchards

on

on low and plain grounds, have many advantages of those *on high grounds*, for the soyle of plaine and low grounds, is commonly more fertil then *hill tops*. Secondly, *low grounds* are more safe from *Wind* then *hills*, by reason of other Trees planted to secure the Orchard, and by *hill houses or other shelters*; *hill tops* can have no defence. As for *prospects on hill tops*, men do not plant Orchards for *Prospects*, but for *Fruits*.

And as for *good Aire*, I suppose there is better Aire (especially at some seasons) in the Orchard *on plain grounds*, then on *hills*, for in *Blooming time*, *winds* would deprive us of the sweet Aire *on hill tops*, but on *plain grounds* the Aire is more calme, and the perfume of the blossomes stays within the Walls, as within a perfumed Chamber.

11 Another Author says, *Set the stones of the Pear-plum a foot deep in cold ground.*

This is a *hurtful and dangerous Instruction*. For *stones* of any Fruits in any ground, put a *foot deep*, are rather *buried then set*, for a man shall ne'er see more of them. But set stones of any Fruits, not above two inches deep, rather something less.

12 One giving *Instructions for Inoculating*, says

Take off the bark just upon some bud
and set the other bark thereon.
a hurtful Instruction; for if the
Inoculated be set upon another
the Stock, then the *Inoculated bud*
possibly close, unless the Root of it
and if the root be out, it's spoyled
way: The Author that talks thus,
never any experience in the *Art of In-*
ing. For buds must be set upon the
best part of the Stock; that they may
to close.

nother sayes, *Set Apple-trees Twenty* 13
sunder.

is is a very *hurtful and dangerous In-*
on, and the practise of it hinders
of Multitudes of Fruits: We see that
ny Orchards, Trees are planted too
together, it may be 4 or 5 or but 6
asunder, which is too near together:
ceive 8 or 10 yards, or there abouts,
enough for the distance of *Apple-*
in ordinary soyle: but if very good
nd, 14 or 16 yards or more, if men
room enough; for we see by expe-
ce that upon *good ground*, and *well-or-*
, they will touch one another at a
er distance: And that a few *Apple-trees*
room to spread, will bear more
then 5 times so many, being crouded

one

one upon another, where they have [illegible] room to spread. And besides, those fr[illegible] they hear cannot come to perfection, [illegible]ther in bigness nor ripeness, for want [illegible] the Sun, which cannot come about th[illegible] when the Trees are planted so near to[illegible]ther, as the Author speaks of. Of th[illegible] see more largely; with divers Rese[illegible] pag. 65.

14 Another Author says, *Cut away all [illegible] idle shoots of the last year, in your Apr[illegible] and Cherry-trees to make your fruit [illegible] fairer.*

This is a very hurtful Instruction; [illegible] the last years shoots are not idle shoo[illegible] for many of them bear the next year [illegible] or the second year without fail: some [illegible]norantly practise according to this Instr[illegible]ction, which is a great hurt to Trees.

Thus much for the first sort of Erro[illegible] *Instructions hurtful and dangerous.*

The second sort are, *Instructions for [illegible]fecting of things impossible to be done by [illegible] means prescribed; and others impossible to [illegible] done by any means* *.

Didymus tells us how we may *mix [illegible]vers kinds of Fruits, and therefore make [illegible] new kind: Accipienda sunt duo diversi ge[illegible]neris*

*There is a Book, call'd *The Country mans Recreation*, or, *the Art of Planting*; which is full of these fancies. Printed in the year 1640.

sarmenta, eaque scindenda per medi-
re. The instruction is too large to
it verbatim; this is the summe. *Two*
of divers kinds must be cut through the
, and the two halves bound together,
must be set in the earth, and watered
they bud forth.

nother to the like purpose. *Bind the*
sts of a Peach-tree and of a Nut-tree to-
r, and the Fruit will be half Peaches,
half Nuts; and again he says, *Bind the*
sts of a white Fig-tree and a black toge-
, and plant them, and the Figs thereof
have the flesh on the one side white, the
r black.

Ova avis in terris, nigroq; similima Cygno.

If men can but make the *Swan* and the
breed together, they may have a
ge kind of Fowl; a black *Swan* it may
which may as soon be done, as to make
se Fruits mix.

These and the like instructions, are ri-
lous, fit to be passed over with a jest,
if men require a serious answer, it is
(truly) by Sir *Fr. Bacon*, in his *Nat.*
, besides clear experience confirms it.
says, *Such grafts will put forth their se-*
Fruits without any commixture in the
fruit. Cent. 5. p. 119, 120.

Cent. 5. p. 119, 120.

fruit. No doubt they will, if it be possible for two half grafts (so used) to grow. We see by continual experience, a small Bud of a Graft (no bigger then a grain of Wheat) will keep it's own nature against a fair large stock of another kind, being inoculated upon it.

2 Lib. cepti veget. c. 1.

Secondly, Another of this kind is laid down by *Albert. Mag.* he layes, *Latanum est unum eorum que præcipue Plantam mutatur à sylvestritate in domesticationem.* Mint (or good sople) *is one of those things which changes wild plants, into a mild and pleasant nature.* This cannot be done by any means. Different kinds of Fruits, as they will not mix one with another, by the means newly mentioned; so neither will they *change into another kind.* Lord *Bacon* tells us, *It is the seed (of any kind of creature) and the nature of it, that locks and boundeth in the creature, that it doth not expatiate, or change from one kind to another.* The seed of every Fruit retaineth strictly the nature of the Fruit of which it came, which will not be changed by any means.

Another of the *second sort of Errors* is this.

3 De Naturæ Rerum Arc. Fol. 7.

Lonicerus gives an *Instruction* for procuring fruits with an excellent *Aromatique*

spicy taste: it is this, *Arborem ad medullam usque scindito, & ligni parte excisâ, aromata quæ volueris inserito, &c.* he says, *Cut a Tree to the pith, and part of the wood being cut out, put in such sweet spices as you think good, then dawb the whole with clay, after lay the branches of the young plant in the earth, that by its moysture and fatness, the branches may unite, then bind together the young twigs that spring from them, so that there may be made one fruit or branch of divers, and the fruits coming thereof, retaine the taste of the spices.*

Another, whose Book (he says) is published by Authority, gives this Instruction. To have coloured *Apples*, with what colour you shall think good: *Ye shall bore a hole with an Auger in the biggest part of the body of the Tree unto the midst thereof, and then look what colour ye will have them of, first ye shall take water, and mingle your colour therewith, then stop it up again with a Pin: and wax it round about.*

Ye may mingle with the said colour what taste ye list to make them tast thereafter: Thus ye may change the tast or colour of any Apples.

Another says, To have *Peaches* of savor like *Musk*; *In grafting, put into the Cleft a grain of Musk: and to have the taste like Roses, put into the Cleft dried leaves of sweet Roses.*

Another late Author, says, *With a Chissel cut up the bark of a Tree round about, and anoynt the bark within with Powder of Cloves, or Nutmegs, then set it on again, and stop it close with wax round about, and within thrice bearing, it shall bring a fair Muscadel Fruit which ye may Graft, and they shall be all after Muscadel fruits.*

This Author sayes further, *To have all stone fruits taste as ye shall think good, lay the stones to sink in such liquor as ye would have them taste of.*

Divers * others speak to the like purpose.

These are strange fancies, meerly imaginary things; neither *Reason* nor *Experience*, dictate any such. They are not onely invalid, or of no power at all to effect what they propose, but are also *hurtful and dangerous* to the Trees and Grafts; for if they might be done without danger, yet are they not able to work any such effects as are promised; For it is not possible such small proportions as they speak of, should communicate and transferre their vertues through

* Amongst many other Authours who speak of these things; See the *Country Farme*, pag. 360, 361, 392, 363, 364, &c. where there are very many odd conceits; about changing the nature of fruits in *shape colour, taste*, &c. To mix *Nuts, Plums*, and *Almonds, Peaches* and *Prunes*: And to have *fruits without stones* See pag. 365, of the *Country-Farme*.

through all the parts of the huge and vast bodies of Trees, and to multitudes of fruits, much less that they should do this for many years, and least of all, that the Grafts (cut from these Trees) should retaine these vertues, being set on other stocks.

May it reasonably be said, That a Mess of sweet and pleasant meat, nay, onely a bit of such meat given to a Child of tender years, the same will retaine the vertues, and strength of such meat all his life time; yea, will transfer the vertues of it to his children after him; when every one knows the strength and vertue of the best meat and drink (though taken in great quantity) is soon over and spent, and that it is a continued daily supply, that does uphold and maintaine the body in good state and condition.

We have no reason to believe that the vertues and strength of any dainty dish will continue so long with us, as *Eliah's morsel of Meat* did with him, which yet was but forty days, and that was a *Miracle* too: how much less reason have we to think it will last many years.

Is there not I say, as much reason for this as the other. Admit it were possible that a small quantity of *sweet spices* should

transfuse, and communicate its properties to all the parts of a Tree, yet it would not continue long in it, but it must be a continued, and *daily supply of such sweet things* as must work that effect, if possibly such a thing may be by any means. Creatures retain those properties that are fixed, and radicated in them *by nature*, according to their *innate and intrinsical form*, but easily and quickly cast off such as are *adventitious and accidental*, as these things are.

Another of the *second sort of Errors*, is this.

Nat. Hist. fol. 6.

Lonicerus gives an *Instruction* to procure *coloured fruits*; *Ramo Ceraſi (ſive alterius Arboris) ſciſſo ad medullam, Lazurium aliumve colorem inſerito, ſic eundem fructum refert*; that is, *Put into the bough of a Cherry tree (or any other Tree) cut to the pith, the Azure-stone, (which is partly green, and partly blew) or any other colour, which are means to colour the fruits of such trees.*

(c) See also the *Country farm*, p. 365 that we may have Red *fruits*, we must set *red Rose trees* under *other Trees*, or near them.

Ruelius saith, *Non desunt qui sub Arboribus Rosas serunt, sic rubra Poma dari promittunt.* *Some set Roses under fruit-trees, and say by that means the Trees will bring forth Red fruits.* So *Democritus*, *Si voles rubrum habere, obtinebis, Rosis purpureis sub arbore (c) consitis.*

The

The same instruction is given by a late *English* Author.

Another says, to have *coloured Peaches, we should colour the kernels within the stones, and the fruits will be of the same colour.*

The same Authour sayes, To have Red *Apples*, put the Grafts into *Pikes-blood.*

We see their prescriptions for rare coloured *fruits*; which are as far off from *Truth or Reason*, as the former concerning fruits of an *aromatique or spicy taste*, for the things are not onely dangerous (some of them) if tried, but if it were not so, yet are weak, and invalid towards the working of any such effects. Because *colour* is an *accident*, cleaving to some substance, and as the substance is dissolved, and converted into another body, it looseth its *accidents* which it had before, as *colour, shape, &c.* as a piece of *cloth, wood*, or the like, being burned, rotten, or otherwise dissolved, does loose its *colour*, or other *accidents* that it had before its change. And *coloured Meats*, eaten and turned into *flesh, blood, and spirits*, loose their *colours, taste, &c.* We well know, that if we drink *Red Wine*, or liquor of any other colour, or what coloured meats soever we eat, the [illegible] and the substance

changed, the *tasts* and *colours*, are also changed, even to *contraries*. So the juyce of the earth, if it be *white*, *black*, *brown*, or any other colour, yet when it is drawn by Roots, for instance, *Carrots*, then it is turned into a *Yellow*, or *Reddish colour*, or if drawn by *Turneps*, it is then converted into a *white colour*, though it were quite contrary before.

So also of *Liquors*, (or other things of delicate colours) being converted into the substance of *Trees*, *Fruits*, *and Leaves*, they loose their former colours, though never so glorious and beautiful. And if great quantities of coloured liquors, or other substances, cannot produce coloured fruits, how much more impossible is it that a drop or two, of any coloured thing, should do it, or only *colouring kernels* (as he speaks of) which could not become Trees of many years after. It's clear, that Fruits convert the substances they draw into their own natures, and receive thereby little or no alteration, unless by a constant and continual supply from year to year; and then so small and inconsiderable (as to these things of *taste* and *colour*) that it is not to be regarded. Indeed, when a Tree grows continually in a *wet foggy place* (or the like continued cause) the fruits may be

mixed therewith; but a small quantity thereof, a few drops or spoonfuls, (the vertue whereof is suddenly gone) cannot do it.

Concerning setting *Rose-trees under other Trees, to produce coloured fruits*, it is one of the most ridiculous conceits that I have read, what is it, that should work the effect? may it be imagined that the Trees can see the *Red-Roses*, as *Jacobs* sheep did the *Rods* in the water, and so bring forth fruits according to the same colour; can any man apprehend so much as a colour, or shadow of a Reason for it? Gen. 30.10

Another of the *second sort of Errors* is this.

Africanus gives an instruction to procure *Walnuts without husks*: *Nuces nudas & sine putaminibus edent Juglandes, &c. Walnut-trees* (he says) *do bring forth bare Nuts without husks, if the husk and shell be broken, and the kernel taken out without hurt, and wrapped in wool, or fresh Vine-leaves, that the kernels may be preserved from Ants, or other things, and then set in the earth again.* 5 So the *Countrey-farm*, p. 362

Florentine affirms the like of *Almonds*, *if ashes be sprinkled in the holes where they*

are set. So another late Author, not only of *Walnuts and Almonds, but of all other shell fruits.*

Were it not a wonderful sight, to see *Walnuts, and all Nuts,* to grow without husks; we know the Nuts of themselves have no stalk, and how then should they grow upon the Tree without husks to inclose them. What is it that should work this strange effect? Is it because the kernels are put into the ground without shell, and for that the Tree springs from the kernels onely? Do not all Trees spring from the kernels onely, though set with their shells? the *husk and shell* contribute nothing at all towards the Tree, they open for the kernel to spring out, and then rot themselves.

Another of this *second sort* is this.

6 A late Author gives Instructions about early fruits, and late; and change of fruits by Grafting; he sayes, *If you graft a late fruit upon an early Stock, the fruit will be early; and if you graft an early fruit upon a late stock, the fruit will be late. As if* (saith he) *you graft Apples on Mulberry trees, you shall have fruit all Summer, even till November. And that if you graft a Plumtree on*

See Country farm, p. 363

the

Nut-tree, the husk will be like the Nut-, but within it will be a Plum. Or if you set a Plum (or any other fruit) on the Fig-tree, the fruit will grow without Blossoming.

These things cannot be; for first, contrary kinds will not grow together, as the Plum-tree and Fig-tree, or Plum-tree and Nut-tree; but if different sorts would agree and grow together, yet these effects would not be, because *Grafts do alwayes rule, and keep their own natures*, or alter very little. *L. B. in his Nat. Hist.* sayes plainly, these are imaginations and untrue, because (saith he) the *Cions* overrule the stock quite. So again, pag. 97. which *experience* confirms. Pag. 109.

Another of the *second sort of Errors* is this.

Democritus (as one affirms) gives an Injunction for procuring fruits with *Inscriptions, and ingravings upon them*, in any figure or shape.

To this purpose: *Open the shell of an Almond, and write upon the kernel what you will, and wrap it in paper, and set it in Clay mingled with Swines dung.*

A late Author sayes, *Steep the stones of Peaches two or three dayes, and then open them,*

them, and with a brass Pen write on the rind of the kernels, after put them again into the stones, and wrap them about with paper, or parchment, and plant them, and the fruit will be written and engraven.

Is not this an odd conceit, that writing upon the (a) kernel, should produce fruit written or engraven? A man (no doubt) with as good success may ingrave, or write upon the shell or husk of an Almond, or other fruit, as upon the kernel; or if he will upon the paper or parchment, in which it is inwrapt: for the Rind of the Kernel contributes nothing to the Tree or Fruit, but opens (as the Husk or shell) to let out the inner part of the kernel, the vegetative vertue, or internal form.

But if a man desires to have fruits with Inscriptions and Engravings, he must take another course, prescribed by a Learned * Author (upon better grounds) which is, by writing upon the fruits with a needle or bodkin, when the fruits are young, and as they grow bigger, so the Letters will grow more large and graphical.

(a) The Authors of the Country farm, affirm that write what you will on the eylet of the Fig-tree which you mean to Graft, and the Figs growing thereof, will contain the said writing p. 363. of the third Book.

* L. Bacon Nat. Hist. p. 128.

Concerning the second sort of Errors thus much.

It were easie to mention many more as idle as these, but I shall not trouble my self,

the Reader with them at present; I say in the general, let men take of such things asserted by Authours, have neither *Reason nor Experience* to hold them, lest they spend their *money, labour, and time* about them, and instead profits and pleasures, find discouragement and trouble.

The third sort of *Errors* are, *Assigning wrong causes to effects.*

One of these *Errors* is this, some have received, that *Grafting is the cause of bearing of fruits, and doth much better all fruit.* *Albert. Mag.* says, it's better, *propter digestionem Succi in nodo factam*: because of the digestion of the sap in the knot. 1 Lib. 5. c. 8. de veget. & Plant.

So also *Crassentius*: and addes, *Et iste facit diversitatem omnem, quæ est in Malis, & Pyris, & cæteris fructibus*: The Graft (which is between the *Graft and the Stock*) makes all the difference which is found in *Pears, Apples*, and other fruits: *Port.* likewise ascribes all to *grafting*: says, Trees coming of seed, *Longa est mutatio ad fructuum productionem: Insita vero in aliquibus eodem Anno producit.* Trees coming of seed, are long ere they bear De Nat. Plant. Li. 2. pag. 87. Li. de Cult. & Insit. Nat. Hist. P. 97.

bear fruit, but being *Grafted*, some [illegible] bear in a year or two. So also *Colu[illegible] Lib. de Arbor. pag.* 490. *Lo. Bac.* wan[illegible] some experience in this point, who say[illegible] *There is no doubt, but that Grafting (for [illegible] most part) doth meliorate fruit:* and ag[illegible] *Grafting doth generally advance, and me[illegible] rate fruits above that which they would b[illegible] they were set of kernels or stones. The ca[illegible]* (saith he) *is manifest, for that the nourish[illegible] ment is better prepared in the stock, than [illegible] the crude earth.*

I say herein these *Authors assign a wr[illegible] Cause to an effect*; *for simply grafting* co[illegible] tributes nothing at all to the early bea[illegible] of Fruit, nor to its goodness. But th[illegible] *Cause* is in *the Nature of the Grafts*: if the[illegible] be Grafts cut from *bearing Trees*, and [illegible] *good kinds*, they bear good fruits in a ye[illegible] or two; but if they be Grafts from *young unbearing Trees, coming of seed*, such Gra[illegible] will not bear the sooner for Grafting; it i[illegible] not *simply Grafting*, I say, nor the k[illegible] (as the Authors speak of) that mak[illegible] Trees bear one year, one day the sooner; for if so, then grafts from *young unbearing trees*, coming of seed, grafted in the same manner, and upon as good stocks as other grafts from *old bearing Trees*, they would bear Fruits the one sort as soon as the other

but it is otherwise: so that the lies not *simply in Grafting*, but in *Nature of the Grafts.*

Neither doth *Grafting* make Fruits (at the better, otherwise then as *you* chuse *of a good kind*, for we know *Grafts* and keep their *own Natures*: onely some small advantage from the *stock*, *special stocks*, or *prejudice* if a very *bad*. And the *Cause* is not well *assign'd* by Author, who says, *It is for that the nourishment is better prepared in the stock, then the crude earth*: for we know the *branches of an ungrafted tree*, receive sap not immediately from the *crude Earth*, but from *stock* or *body*, as well as the *branches* the *Grafted-tree*: the stock of the *Grafted-tree*, is a wild stock, and of the same Nature, as is the stock or body of the *ungrafted-tree*: they are both alike, and the concoction and nourishment in both, is alike, and the *Cause being alike*, why is not the effect alike. It's plaine, it is not the *Cause*; but the *Cause* is in the *Graft*, not in the *stock*, though the nourishment be never so *well concocted* in the *stock*: and the Fruit is not made better or worse, *simply by Grafting*: The Authour asserts this Truth plainely elsewhere; *The Graft* (saith he) *overruleth*

Nat. Hist. p. 109. and p. 115.

ruleth the Stock: and again, *the graft will govern*; that is, they keep the Nature and properties of the Trees from which they were gotten.

Another of the *third sort of Errors*, is this.

2 Of this, see also *Mason Rustique*, or the *Country Farme*, where the same is asserted, pag. 362.

A late Author sayes: the *Cause* why Trees bear not fruit in a few years after Grafting, is, *because they were grafted in the old of the Moon*: *for* (saith he) *so many dayes as the Moon is old when you Graft, so many years will the graft be ere it bear fruit.*

The *Cause is here mistaken*; for the *Moon* hath no such influence upon fruit-trees, as to withhold their fruits in this manner: Men (we see by experience) graft in all seasons of the Moon, and find no such difference in the bearing of the Trees: The chief *Causes of unfruitfulness* of Trees, are, when they are not fit for the *Country where they are planted.*

Secondly, *When the Grafts are chosen from young, wild, unbearing Trees; or such as naturally bear little or seldome.*

Thirdly, *Repletion, or overmuch nourishment.*

Fourthly, *Coldness or overmoistness of the ground.*

Fifthly, *Frosts or cold winds in the spring.*

Thirdly,

Thirdly. Another of the *third sort of Errors*, is this.

Many conceive that *Sap in Trees doth descend from the Branches, to the Roots, which causeth several effects; as falling of the leaves, goodness of the Roots of divers Plants for use, &c.* but the *Cause* of these *Effects* is mistaken, for *Sap* in *Trees* never *descends*, but always *ascends*: And *leaves of Trees fall in Autumne*, not because *Sap descends from them*; but because *Sap ascends not to them*, sufficient to nourish, or feed them any longer. And if *Roots are best in Antumne*, that is not *Caused by descent of Sap*, but for that the Body and Branches of a Tree in *Autumne*, draw but a small quantity of Sap from the Roots, and the Roots *even then*, draw sap from the Earth, and increase upon it, and are well stored with sap after the Branches have done increasing: and there the sap rests chiefly *at that season*.

Some who hold *descending of Sap*, may (perhaps) confirme their Opinion from small springs of the Roots of Plants when they are removed in *Autumne*. It's true, The Roots of Plants set in the beginning of *September* (or about that time) do spring forth a little at the cut ends of the Roots, before

before Winter, *not because Sap descends from the Branches to them*, for though the Branches are cut off before setting (as sometimes they are) yet the Roots will spring then, because some degree of heat, (proportionable to that purpose) is, at that season, in the top of the earth, by reason of the immediate foregoing Sommer, so that Plants set while this heat lasteth, they will *germinate*, & spring forth in their roots before Winter; (the husbandman knows in this season it is best to sow his *Wheat* and *Rye*;) And also because the Sun (as yet) hath an influence sufficient to make seeds and Plants to spring forth, which towards *December* it hath not, being then too remote from us, so that it is not *descending of Sap* that causeth these effects.

Nat. hist. p. 111. & 94. The learned *Lord Bacon* did not well consider this point, who supposed *a descention of Sap in Autumne*, speaking concerning setting a Bough in the ground prepared by disbarking for that purpose, sayes, *The Cause why it will soon after be a faire Tree, may be this, the baring of the Barke keepeth the Sap from descending towards Winter*: here's *a wrong Cause assigned to an effect*, for it is not the supposed keeping up of the *Sap* (by that means he speaks of) that *Causeth* such a Bough to grow

the better, but the cause is, for that ... bough by disbarking, hath got some ... Ropes or strings, (or at least, some ... ness or knobs capable of Roots) in ... *passage up of the Sap*, whereby (being ...) it will become a Tree in certaine ...

This Opinion of *descention of Sap in* ... is an old *Error* of many years stan- ... and is radicated in the minds of most ... : yea, many using it as a similitude to ... rate some *spiritual* matter, as if it *were* ... and undoubted truth, whereas it is ... a weak and groundless conceit, and ... rary both to *reason* and *experience*, ta- ... up by men from hand to hand, with- ... consideration, or weighing of, it with ... and *judgment*. I will therefore lay ... en more plainly, and demonstrate and ... the Truth concerning the *motion of* ... *in Trees*.

Woodmen and others are generally of this opinion, as having received it from their fore-fathers for an unquestionable thing.

The first Argument against *descention of Sap*.

Sap in Trees always moves upwards, and ... contrary to the Law and course of ... ure for *sap to descend*: *Natura nil agit* ..., Nature does nothing in vain. Now ... were a vain work in Nature to cause *sap*

to ascend up in the branches, to descend again to the Roots; the Roots send Sap to the Branches, and not the Branches to the Roots. When it once comes into the Branches, it is converted into *Wood, Bark, Leaves, Fruits, &c.* Whence is all that great *Bulk and Body* which we see a Tree arise to in a few years; if *Sap* should *descend* one while, as it *ascends* another, it would follow, that as a Tree increaseth by *ascension of Sap*, so it would *decrease by its descension.*

This may be more clear if we consider the *cause* why *Sap in trees stirs and ascends*, and also why it riseth not after such a time to make any growth. When the Sun in the Spring of the year by degrees draweth nearer to us, then *Sap in Trees* begins (by its heat and influence) to move, to swell, and open the Buds, and so cause the branches to shoot forth, which increase by it all the Summer: and as the Sun (by degrees) draws nearer, and grows hotter, so the Sap (by degrees) increaseth, and riseth more plentifully, and when the Sun is neareſt, then Trees are fulleſt of Sap.

Now observe, as by the vicinity and nearneſs of the Sun (which is by degrees) the *Sap* is increased by degrees, so likewise by the Sunnes remoteneſs and abſence (which

(which is also by degrees) in his going back again; the *Sap* is also diminished by degrees, that is, *ascending* less and less in quantity, until the Sun be gone so far from us, and the heat and influence of it be so weak, that it works not to cause sap to rise up, whereby the branches may increase any longer, and then the Branches and Buds of Trees are all at a stand, and grow no more until the next Spring. And at that time the leaves loose their beauty, and fall off, because *Sap riseth not up sufficient to feed them any longer*, but onely so much as to preserve life in the Tree.

The second Argument. There is no *cause* to *produce* such an *effect*.

I would fain know (of those who hold *Ascension of Sap*) what should *cause it to descend*, for, *Nullus effectus datur sine causa*: there can be no *effect* without a *cause*; they cannot say that as *heat causeth it to ascend*, so *cold causeth it to descend*: Cold never *causeth sap* to stir, but to stand or move slowly. Cold is of a condensing nature, and does constipate, and fix rare & fluid *bodies*; if cold should cause *sap to descend*, then as the cold increaseth, sap would *descend more & more in quantity*, as on the contrary,

as heat increaseth in the *Spring and Summer*, the sap in Trees also increaseth in quantity; and if so, what would become of the Trees? But if *sap* of its own nature would descend, yet there is none in the Branches *at that season of the year*, that they can spare, but all that has *ascended* in the *Summer*, is converted into the substance of the *Tree*, its *Leaves*, and *Fruits*.

Concerning that Objection that is made against this, and brought as an Argument that *sap descends*, viz. That if we disbarke a bough or branch when sap is up, an inch round about, and lay, and keep up mould about the disbarked place, there will be small *Roots* in the upper part of the place so disbarked, which (say they) are caused by the *descension of Sap* out of the bough to that part.

To this I Answer, That such Roots are not made by any *descension of Sap*, but by the *ascension of Sap*; for sap *ascends* up into such a bough, notwithstanding the disbarked part, through the *pith* and *pores of the wood*, though in smaller quantity then it would do if the bark were on. This is plain, because such a bough does grow and shoot forth, and bear fruit after disbarking, which could not be, but by the *rising up of Sap*. Now I say, sap in its ri-

sing

ging up, some part of it is pendulous about that place, and does somewhat *hang* or rest at the upper part of the disbarked place, in the very edge of the bark; having recourse to this (*b*) *wounded part*, in greater quantity then to any other part, and so by reason of the Earth, and *moisture* about it, breaks forth into some small Roots in some kinds of Trees, or into some *roughness*, and small *knubs* like *Roots*, but this cannot be caused by *descension of Sap*, if any were: for such as hold *descension of Sap*, pretend not to it until *Autumne*, or about the end of *September*; Now these Roots are made long before that time, in * *Sommer*, by the rising up of Sap, as was said, (especially if the bough be disbarked in *May*.) Can the *effect* be before the *Cause*? can Roots be made in *Sommer*, by Sap that descends in *Autumne*? if any such thing were; so that this Argument for *descension of Sap*, is of no weight, but is weak and childish.

(*b*) Sap has recourse to this part especially, because it is wounded: as *blood* and *humours* in the body, flie to the part that is *cut* or *hurt*, to succour it, and so do abound there. This is so by the Law of *Nature*, as well in *Trees*, as other Creatures.

* Upon *Midsommer day* I have taken off the earth, and looked upon the *place disbarked*, and Roots were come out well nigh an inch long.

The third Argument against descension, and also Circulation of Sap; *It is contrary to its Nature.*

As concerning *Circulation of Sap in Summer*, which some also hold; I apprehend no more ground for that, then for *descension in Autumne?* For as there is no cause to work such an *effect*, so neither is it natural to sap to have such a *motion* of it self. For, *sap riseth in Plants* in some sort like a *thin airy vapour* from some moist substance partly caused by the heat of the Sun: the *Sun* is the *efficient cause* of the *rising up of Sap*, though also (and principally) the *vegetative spirit* (excited by the Sun) carries it up, and dispenseth it to all the parts for nourishment and growth. Now, we know there is no *descending* of *Vapors*, in the same manner as they *ascended*. *Vapors* come not down again to the Earth, until they be *condensed*, and *thickned* into *Rain*, *Snow*, *Hail*, &c. When they are become *a ponderous and weighty substance*, then they naturally tend *downwards*, not whilst they are a *light airy substance*: so is it concerning *Sap in Trees*, it ascends (partly by attraction of the Sun, and partly by the Native spirit) as a *thin airy substance*, *subtile*, *light*

Deut. 33. 14. *Pretious fruits brought forth by the Sun.*

light spirituous as well through the pores of the *wood*, as between the *bark* and the *wood*, where it rises more plentifully, and is more *condensed*. Now, while it is thus *light* and *vaporous*, it can neither *descend* nor *Circulate*, for every *light body*, (as *flame*, *aire*, *smoak*, *vapors*, &c. *ascends* upwards, (*omne leve sursum*) and cannot *descend* or fall downwards, no more then any *heavy thing* (as such) can rise or *ascend upwards* by its own natural motion. Indeed when Sap is turned into *wood*, *leaves*, *buds*, *blossoms* and *fruits*, these things have some *ponderosity* or weight in them, and so naturally *descend*, *Omne grave deorsum*, As *aire* and *vapors*, being condensed, and become *water* in the *Clouds*, do naturally fall *downwards*; but whatsoever is a *thin*, *aerious*, *light* body, *ascends upwards*, and cannot (as such) neither *descend* nor * *circulate*, and *such a substance is Sap in Trees*.

* See Mr. *Grbr. Plats hidden treasure*, p. 78. where he asserts, That all *Trees*, *Plants*, and *Fruits*, *are made of Vapors condensed.*

Fourthly, *The Appetite of the Spirit in all Vegetables is upwards.*

There is an *innate spirit* in *Trees* and all *Vegetables*, (which some call the Soul of Plants) yea, in all bodies *animate* and *inanimate*; this Sir *Fran. Bacon* hath abundantly set forth: This *Spirit* (as he shews)

4 Argument against descention & Circulation of Sap.

shews) is (as it were) a compound of *flame* and *aire*, is of a *sulphureous* and *aerious Nature*. Now, this being the *Vehicle* or means of conveyance of the Sap unto all the parts of the Tree, (every *Twig* and *bud* of it) its appetite is *upwards*, because it is a light body, and all light things naturally *ascend upwards*, as was said, and not *downwards*, unless it be to observe a *Law* in *Nature* in avoiding a *Vacuum* at any time. The greater quantity of Spirit there is in any creature, the *leighter* it is, either animate, or inanimate, especially if it be the *liuely spirit*. If it be said this *spirit in Tree* exerts it self *downwards* in the *Roots*, as well as *upwards*, it is true, so much, and so farre as it necessary to make a *foundation* to support the *body and branches*, and to draw nourishment for *feeding* & *increase* thereof, which it doth but only in a subservience to the *body* and *branches*, and though the *Roots* spread *wide*, yet *depth* is but *little* to the *height* of a *Tree*; the *Roots* spread, and run as near the superficies and top of the Earth, as may be, as having still an appetite upwards, as near the Sun as may be; and all the *Sap and moisture* which this *spirit* carries *upwards*, (which is by far the greatest part,) it never carries down again; being against its nature to *descend*, as it is a leighter body.

Nat. Hist. p. 36. l. 5. & Hist. of L. & d. p. 387.

The

The Fifth *Argument*.

And further as another *Argument* from *Experience*, and that which is obvious to our very *sence*, we see, and know, that when we bend down a bough of a Tree upon a wall *towards* the *ground*, to cause it to *grow* and *spread* as near the Bottome of the wall as may be, we find (I say) how poorly such boughs do grow, shooting forth but a very little, and sometimes a part dies, and sometimes all; and this shews its against the *Nature* of Sap to *descend* or *circulate*; for otherwise why are not such boughs (so *bended downwards*) as plentifully fed with *sap* as those that grow straight up, or straight out, and not so much bowed as the other: so it is in plasht hedges, if boughs be laid out low, they die, or grow poorly: but we see the Sap presses *upwards*, with vigor and violence; the boughs and branches that grow upwards, shoot forth strongly, and are full fed, but such as bow down low, are almost starved: so that its plain, its as much against the nature of *Sap* to *descend*, or to *circulate*, as it is for *water* to *ascend*; which yet we know by Art, may be made to *ascend* in Pipes, from below, as high as the *fountaine* or *spring*, but

but no higher; for its *natural motion* is to *descend*; so say, though its natural motion be *upwards*, yet by Art, (being ascended up into a branch) it may be somewhat forced *downwards*, and yet very hardly, slowly, and weakly, although to the nourishment & keeping life in any of its parts or *branches* so bowed down, which plainly shews how much against its nature the motion of *descension*, or that of *Circulation* is.

The Sixth Argument against *descension* of *Sap*.

And lastly, to prove this more fully and clearly by a plain undeniable Argument. *If there be a continual ascension of Sap in Trees, then there is no descension, but there is a continual ascension, therefore no descension.*

To prove the *Minor Proposition*: That *there is a continual ascension of Sap in Trees.*

Nat. Hist. & Hist. of L. and D.

The Sun and Aire continually draw *Sap* and *moisture* out of Trees and other *Vegetables*, as the Lord *Bacon* and others conclude, and as may be made appear by *reason and experience*: We know, if Branches and Twigs of Trees, being cut off, and laid aside in the Sun and Aire but a few

they will be contracted and
the aire draws out the Sap
moisture, and such having no supply
from the Root, they quickly wi-
Now, know also, that the sun and
have the same operation upon the li-
Branches and Twigs; drawing sap and
continually out of them likewise,
they are not contracted and wrinkled
other, because there is a continual
of Sap from the Root, as well in
as in *Sommer*, which keeps them in
full dimensions without wrinkling or
ing.

further observe, to prove this. If we
Plants in September, or about that
the pretended season of *desertion*
) and let them lie out of the earth
or two, we shall find, that the Sun
Aire will (in that short time) have
and drawn out *sap and moisture* from
unches, so that they will be appa-
shrunk and contracted. (I have seen
branches so much wrinkled, that I
med whether they were dead or a-
But after the Plants have been set
days, *so much sap will be ascended*,
again have filled up the wrinkled or
ted bark, so that it is evident and
ent hereby, that some small quantity

of

of *sap* hath (*even then*) *ascended* into
branches since their settings; and if so,
it's clear there is no *descension of sap* for
any thing move *contrary* ways at one
And if we graft in *November* and *Decem*
as I have done with good success (the
dead time of *Winter*) the grafts have
small supply of sap even then, else the
and Aire would spoyle them, by dail
king out their moisture, were there
supply of Sap from the *Root*, suffici
keep them alive until the *spring*. It's
fest then from what hath been said, th
in Trees *ascends as well in Autumn and*
ter, *as in Summer*, so much as to pre
life in *Trees*, by supplying what is exh
by the *Sun and Aire*: so that upon thi
it may be concluded there is no *descen*
of sap; unless men will hold that a
may move several ways, *upwards* and
wards, at one and the same time, whic
a contradiction, and impossible in natur

Thus much concerning the *three* sor
Errors in the Theory of this Art.

First, *Instructions hurtful and dangero*

Secondly, *Instructions for effecting* so
things impossible to be effected by the me
prescribed, and others impossible to be effe
by any means.

Thirdly, *Assigning wrong Causes to* ef

discover some *Errors* that I find
the practise of this Art of Planting
Fruit-trees, that they may be
avoided.

One *Error in Practise*, is this.

1 *Planting Trees too near together*.

nting Trees too near together: This is
t and general *Error*, many think the
Trees they have, the more Fruit:
few having room enough to spread,
ear more fruits then many crouded
on another, as the custome is, and
will also be better when the Sunne
comes round about the Trees. I ac-
8 or 10 yards a competent distance
Apple-trees and Pear-trees upon ordi-
soyle, but if the ground be special
then give them the more room; for
lard *Cherry trees*, *Plum-trees*, and such
5 or 6 yards is a convenient distance.

Another *Error* is this.

2 *Planting Trees unfit for the Country*.

Many *Plant Fruit trees unfit for the Coun-*
where they Plant them: Their care is
ly to chuse grafts of the best kinds, and
Plants to look upon, not considering so
ch, whether such kinds will prosper,
and

and bear fruits well in those *Climates* ... places where they plant them. And ... It is seen, that many who have fair ... goodly fruit-trees, have very little fr... from them. It is an excellent rule to c... those kinds of fruits, which we (or other... find by many years experience, to be go... bearing Trees in those parts neareſt to ... although the fruits be not altogether ... good as some others.

This is another *Error*.

3 *Chuſing the greateſt Trees.*

Many men when they procure ... trees to plant an Orchard, they (... commonly) deſire the *greateſt and ... Plants*, hoping ſuch will be Trees the ſoo... eſt; whereas *great Trees* many of th... die, and others live very poorly, but ſ... *Plants* removed, live generally, and thri... more in two or three years, then gr... ones in ſix or ſeven; for removing gr... *Trees* is a very great check to nature, ſuch as many times is not able to recover.

Another *Error in practiſe* is this.

4 *Setting trees without Diſtinction.*

Men generally leave *too many branches* ... the *Trees they Plant*, and will by no mean... have *Branches cut off*, whereas for want ... dif-

branching Trees, they loose *branches, roots*, and all. If they will *Plant* great trees, they must disbranch them, small ones need not, or very little.

Another is this.

5 *Planting Trees in worse mould.*

For the most part men neglect to *Plant* their young Trees *in as good or better soyle*, as that from which they are removed. They fetch them from *Nurseries* about *London*, (which are generally of very fat *soyle*) and plant them (it may be) in ordinary or poor *soyle*, and thence it is that many of them die, or grow weakly: whereas they ought to lay special soyle (the best they can get) next to the *Roots*, which having taken hold, and being well rooted in the ground, they will by degrees, thrust their roots, and grow well in that which is worse.

Another is this.

6 *Setting Grafts and stock smooth on the out-side.*

Some in Grafting, take care to set the *Graft and Stock even and smooth on the outside*, not considering that the bark of the stocks are (for the most part) thicker then the bark of the grafts. Whereas they ought to take special care to *set the inner-sides*

sides of the Barks together, (which is the chiefest Rule in Grafting) because there is the chief current of the Sap.

Another Error is this.

7 *Grafting long or forked Grafts:* commonly, the longer grafts are, the less they grow; and the shorter they are cut, the longer they grow in a year. As for forked *Grafts*, either they take not, or else grow but poorly.

Grafting long, or forked Grafts.

Another is this.

8 Many let their *Fruit-trees grow straight up very high, before they spread into boughs*, and they are rather like *Timber-trees* for building, then *Fruit-trees* for bearing Fruits.

Suffering Fruit-trees to grow like Timber trees.

Whereas they ought to cut off the Top while the Plant is young, about an Ell, or a yard and half from the ground, that so the Plant may spread and enlarge it self; and one Tree well ordered in this respect for spreading, will have as many fine boughs (and consequently will bear as much fruit) as three or four (it may be) of such Trees as runne spiring up a great height without spreading.

Ano-

Another *Error* is this.

9 *Giving too much nouriſhment to fruit-trees.*

Some give *too much nouriſhment to ſome fruit-trees*, Letting ſome fat water (it may be) run to the Roots, or lie too near them, or elſe by powring, or laying ſome fertil dunance to their Roots, when there is (ſometimes) more need to deprive them of their too fat feeding, which cauſeth them to luxuriate, and ſpend their ſtrength in great and large ſhoots, and broad leaves and bloſſomes, and leave off bearing fruits: Nouriſhment to Fruit-trees ought to be moderate, as to other creatures.

Another *Error in pruning*, is this.

10 *Pruning off too many ſhoots from Wall-trees.*

Many in pruning *Aprecot-trees*, and other *Wall-trees*, they prune off moſt of the *young branches of the laſt years ſhoot*, and preſerve the *old and big branches*, ſuffering them to run up a great part of the wall without, or with very few ſmall twigs or branches. Whereas they ſhould ſtill (year to year) preſerve the ſmall ſhoots, nailing them up to the wall yearly, (or moſt) from the loweſt part of the tree to the top, and leave no part of the wall void of branches; and cauſe the

branches to spread along the sides of the wall both ways, and not suffer them to run *upwards* too much.

Another *Error* amongst some, is this.

11. *Grafting seed Plants before removing.*

They *Graft young Plants* that came of seeds in the place where they were sowed, (before they have been removed, whereby they would get *good Roots.*) And hence it follows, That such thrust down a *single Root*, or two (commonly) into *Clay, Gravel or moist ground, &c.* which root or roots, draw bad nourishment below the good soyle, and thereby hurt the *Tree and Fruits*; and in case any of them be removed afterwards (being grafted) they want *good Roots*, for that they were never removed, being young, to get good Roots. See how to order them, pag. 83.

Another is this.

12 *Not Pruning the Roots of Plants.*

Some also when they Transplant young Trees, they shall set them with all their Roots, whereas the *Roots* of all Trees *Transplanted*, ought to be pruned. See how pag. 83.

Another *Error* is this.

Many break off all the Buds upon the stocks that are engrafted, before the grafts put forth, which endangers both *Stock and Graft*. For Buds upon the stocks should be let alone, all or most, until the Grafts have put forth, and be able to draw up sap, and then break off all the buds below the Grafts, that they may have all the sap. 13 *Breaking off Buds before Grafts grow.*

Another *Error in practice* is this,

Many when they Graft great Trees which are unfruitful, or bear bad fruit, they graft upon their bodies round about, between the bark and the wood. Now Trees thus grafted, will not of many years, (and some never) cover the head in the grafted place, but water gets in and rots the Tree, whereas its much better to graft the small branches, or if those be too high, then to cut off the body two yards high Slopewise, and to cut it smooth, that no rain or wet may rest on the head, and the next year after to graft the small shoots, which will in a few years be a large head again. 14 *Grafting great bodies of Trees.*

Situation of an Orchard.

HAving before ſpoken of *ſowing, ſetting, Grafting, and ordering of fruit-trees*; I think good now to ſpeak ſomewhat of the *ſite, ſoyle, ſhelters*, and ſome other advantages of an *Orchard and Garden*, and alſo of planting *Fruit-trees* in the *fields*, and in the *hedges* and *mounds* about the *fields*; whereby *double, treble*, or manifold profit may be made of Lands to what is uſually (in moſt places) made, eſpecially by *Cider* and *Perry*, to the great advantage of the owners, and of the Common-wealth, with planting of wood for building, fuell and other uſes. And alſo of divers other things (promiſcuouſly) in reference to *Fruit-trees and Fruit*. And although ſome of the enſuing particulars are touchт upon already, yet I thought good to mention them again, with ſome addition, ſeeing they are very material; yet all very briefly.

What

What Situation is best for an Orchard.

Concerning the *Site, or Situation of an Orchard*, or *Garden of Fruit-trees*; the *best* and *fittest situation* is upon a ground some-what *shelving* or *declining* upon the *South-East Sun*; for as the *South-side* is the warmest and hottest, so also it is observed by Experience, that the *Morning* or *East* Sun, is better then the *West* Sun: it doth cherish and ripen fruits sooner then the *Afternoon* Sun, though that be good also: And if the ground somewhat shelve, or hang towards the *South-East*, it has an advantage of *level* or *plain ground* (though that be good too:) for the Sun-beames are more direct, and so more strong upon such a ground, then upon a level: such a ground is fitted to the Aspect of the Sun: which is, *Cœlum cum terra maritare, vel societatem perquirere cœli & terræ ad arbores: To Marry Heaven and Earth together, or to obtain a mutual Society of Heaven and Earth for the benefit of Fruit-trees.* *Bapt. Port. Li. 1. p. 16.*

What Soyle is best for an Orchard.

As for the *soyle of an Orchard*, the best is a deep *sound land*, either a *black*, or

brown mould, if with a mixture of *sand* so much the better: in such ground, so lying as before, Fruit-trees will attain to a very *great bigness*, and consequently will last *much longer then* the same kinds of Trees, upon a *shallow gravelly ground*; or upon a *clay*, *cold*, or *wet ground*. Fruit-trees where they grow upon a *warm ground*, and upon the *South-East Sunne*, as the Trees grow great, and live long, so also the fruit is greater and better, and much *more in quantity*, then upon *poor*, *gravel*, *wet*, *cold*, or *clay grounds*.

Howsoever, men that have not the *best*, must be content to Plant upon what they have, and endeavour to amend it as they can:

Cold and moist ground.

Grounds that are *over-moist* and *cold*, must be not onely *trenched* in several places, to draw the water into the Trenches from the Roots of the *Trees*; but also it will be convenient to mix *sand*, *ashes*, or such like *hot and dry soyls* with such ground: if these or some such means be not used, the *Roots* of the Trees (upon this kind of ground) will be *chil'd*, and lie *cold*, and cause the Trees to be *mossy*, and the fruit to be *more spongy and waterish*; not so good as of

fruits, as if the Trees grew upon *warmer and dryer ground.*

Hot and dry grounds.

Fruit-trees upon *hot, dry, sandy, shallow grounds*, have need of some current of water now and then, to runne over such grounds, if it be possible to have it so; or the paines must be taken to bring water some other way: water out of *Pools*, or *Ponds*, that runs from *dunghills*, is special good for this purpose, which does not only moisten, but makes the ground fertil also.

Cold Clay grounds.

If the Land whereon *Fruit-trees* are, or shall be planted, be *Clay grounds*, a shallow crust of indifferent good soyle (it may be) on the top, and *Clay, barren soyle* underneath (as is often seen) then there is need of some *Composts* of contrary natures to be mixt among, with this *stiff, cold, barren ground*; as *Sand, Ashes* of all kinds, a convenient quantity of *Lime, Chalk*, or any thing that is of an hot and opening *nature*. Yea, and let men do what they can to *mend this kind of Land*, yet the Trees will still be *small*, and but *small Trees*, in comparison

of the same kind of *Trees*, upon *good, sound, deep, fertil soyle.*

Stony gravel ground.

As for *gravel grounds*, they are as bad as any, in some respects; for a tree cannot *root* to any great *bigness* in such *grounds*; and if *muck*, and other *soyles*, be laid to the Trees, the *Gravel* will eat it up, and turn it into its own nature in certain *years*. But if the ground be but somewhat stony, with a mixture of *Mould* between and among the stones, the fruit-trees will root indifferent well in such grounds; all that can well be done, is to dig up, and loosen the stones as much as may be, and to pick out some of the *biggest*, and cast in some *good soyles* in their sted.

Low bottome grounds.

Land that lies *below*, towards the *bottome of the Hill*, or *near a River*, which sometimes *over flowes*; This generally is exceeding good for *fruit-trees*, it hath many advantages of some other grounds; for it not only keeps and retains what *rain* and *moisture* falls upon it from the *Clouds*; but also *moisture descends* from the higher

grounds

to these, and withal, if the River overflow, it adds much to the *fatness of the ground*. But yet this is to be considered, That land may have *over much moisture* (as before is observed) That is, when it standeth, and rests all the year long in, and upon the ground, as some *wall springs*, and *boggy low grounds*, where the superfluity of water cannot descend from it to any other place, but where much water comes, and rests for a certaine time only; and then the superfluity runnes off, and leaves onely the *strength & fatness of the water behind*, there the land is *good* and *fertile*, and *fruit-trees* will grow *large* there, and the *fruit great*. And so much for the *ground fit for fruit*.

Concerning shelters or defences for Orchards and Gardens.

ALthough it be not absolutely necessary that *fruit-trees* be *sheltred*, or *defended* from the *cold North*, *East* and *West* winds, yet it will be very convenient and profitable so to do, as much as may be; for we know, and see by yearly *experience*, how dangerous the *East*, or *Northeast winds* (especially) are in the *spring* time, as in *blighting* and *spoyling* of *blossomes*, *fruits*, and some-

sometimes the *very boughs, branches,* and the *Trees* themselves.

And the *West winds* are commonly strong towards *Autumne*, and throw down abundance of Fruits, when ripe, or near ripe, wherein is losse: so that if the Orchard be planted where it may have *Hills, Houses*, or such like, to burrow, or shelter it from the *North, East*, and *West-winds*, it will be a special advantage to it.

Walnut-trees good shelters for Orchards.

But if there be no such shelters, it will be very profitable to Plant *Walnut-trees* (or some other kinds of Trees that naturally grow *great and high*) upon *these three sides* of the Orchard. The *Walnut-tree* is profitable very many ways, not only as to *shade* and *shelter*, but also the wood is of manifold use, and much dearer then *Oak, Ash, Elm*, or such like: the *Fruit* * is useful and profitable, both *green and ripe*; so the *leaves, bark, juice*, &c. in many Physical respects. Mr. *Parkinson* says, the profit of *Walnut-trees* is infinite.

It is a good encouragement to Plant these *trees* also be-

* The fruit is accounted a special remedy against *Poyson* and *Pestilence*: *Avicen* says, Lib. 2. Can. C. 501. *Juglans sicubus & Ruta Medicina omnibus venenis. Walnuts with Figs and Rue, is a medicine against all poyson.*

[illegible]ause (as they are so many wayes pro-[illegible]ble, so also) they *endure exceeding* [illegible], and will prosper well almost in any [illegible] *of soyle*, or in any *Country*: this was [illegible]ved long since, *Bap. Port.* says, in for-[illegible] times, it was accounted an *excellent*, [illegible] *singular Fruit-tree*: *Juglandes egre-[illegible] existimarent*. And *Crescentius* gives [illegible] encouragement to Plant this tree: *[illegible] arbor nullum recusat terram, neque genus [illegible]* (he says) *This Tree refuseth no kind [illegible] nor earth.* L. 2. de Arb. Nat. Pag. 242.

Now, seeing it prospers well in all pla-[illegible], and is so many ways profitable above [illegible] other kinds of Trees, and so fit and [illegible] for the sheltring of the Orchard, [illegible] regard of the exceeding great height [illegible] bigness that these Trees attain, and [illegible] *long time* that they last, let there be (therefore) many of them planted with-[illegible] the Orchard to *shelter it*, as before is [illegible], so many as may be convenient for [illegible] purpose.

[illegible] many of the best thin-shell Nuts in [illegible] Nursery, when they are fully ripe, and [illegible] them there three or four years, [illegible] they be a competent bigness to re-[illegible] for this purpose: if they be set with [illegible] green husk on, it is so much the bet-[illegible] to preserve them from worms, &c.

Quan-

Quantity of grounds for an Orchard.

Having considered of, and found out a *fit place* for an *Orchard*, in respect of the *lying of the ground, soyle*, and *shelters* for it, the next thing is to designe the *Quantity*. And herein let not men be niggards to themselves their *posterity*, and the *Common weal*, in allotting a *small quantity*, When they may take much: For the *Fruit trees* will yield (after certain years) *many times their profit*, then the *Corne* or *Grass* of so much land: Especially if converted into *Cider* and *Perry*. Of the *Profits* of *Fruit-trees*; see Mr. *Blith*, his *Improver Improved*, pag. 262, 263, &c. Where he shews Land may be improved, by *Planting* 8 or 10 times the value, and more.

Such as begin soonest will have most profit.

And they that *begin, and first* set on this *work* of *planting large Orchards*, and *fruit-trees* in the *fields* and *hedges*, will have not onely the *speediest*, but the *greatest profit*: because *now, as yet*, there are but *few*, or no *great Orchards* in some *Countries*; and while so *great a commodity* is in the *hands* of a *few men*, it will be exceeding advantagious

but when it is more common, the advantage will be less. Therefore, if you be but willing to make 20 l. worth of 50 l. or to make 100 l. a year, of 3, or more, this is the way, with little labour and charge.

Profits, with little Cost or Pains.

That work is of *so much profit*, with so *little cost and pains*? *Corn* and *Cattle* must have renewed *charges and labours* every year. But as for planting *Fruit-trees*, there the charge is at the first, and little or no trouble after, and the *profit* still increaseth more and more for many years. *Fruit-trees* have an advantage, and excellency above other *Commodities*, which (for the most part) are *best at first*, and grow *worse*, till nothing worth at all. (As Meat, Drink, *Apparel*, &c.) but *Fruit-trees* increase in *worth and goodness*, are *least and worst at first*, and of the mending, and improving hand for many Years or Ages.

Orchard and Garden on the South-side.

In planting the *Orchard*, let it be on the *South side the house*, rather than on any other side; the house will be a *shelter* to it from

from the *North*; and beside, into the *South* is the sweetest and most pleasant prospect, and much the better for the Orchard: And if it may be (as in some places it may) plant *Fruit-trees round about the house.*

Build the House in the midst of the Orchard.

Men that are to *build the house*, as well as to *plant the Orchard*, were best to build the house in the midst of the Orchard; and so they may live in a *sweet, perfumed, wholsome Aire*, all their days; which will not be a little conducing to *health* and long *life*; besides all the *pleasure* and *delight* superadded.

Sweet fresh Aire, conduceth to health and long life, more then diet, as an Author of great esteem affirmeth. How *healthful* it is to live in a *sweet fresh Aire*, not onely learned and judicious men tell us, but also Experience. Of this, see Lord *Bac.* Hist. L. D. pag. 207. 208. Nat. hist. Cent. 6. pag. 210. Cent. 6. pag. 136. Nat. hist. Cent. 4. pag. 102. and divers other places; so also a whole Colledge of *Physicians*; See Scho. Sal. pag. 51.

Many

Many stocks of Bees may be kept in a great Orchard.

Now, besides all the profit and pleasure that may be made of an Orchard in an ordinary way, by *Cider*, *Perry*, *sale of the fruits*, *and use of them all the year in the house*: there may be another profit made of them, by the labour of the industrious *Bees*, which may be kept in or about the *Orchard*, which will gather store of *Hony* in the *blossoming time* from the *fruit-trees*, and the more, and sooner, because they (in such a place) need not labour far for *Hony*, as having it near hand: I have read of an eminent *Bee-master*, who yearly, set many stocks of *Bees* by, or in a great *Field of Pease* and *Beans* in blooming-time, out of which the *Bees* did store, and fill their hives with Hony in a very short time, as having it so near at hand; the like they will do in an *Orchard*, or *Garden of Fruit-trees*, having great store of provision ready at hand in an *Orchard*. Also, unto all this provision for *Bees*, *Ciccamore-trees* may be planted, on the *North*, *East*, and *West* of the *Orchard*; and *Sallies*, *Withies*, &c. which bear *Palms* early: all these yield abundance of provision for *Bees*: Now, the nearer

nearer they have their hony and wax, the earlier and oftner they will swarm.

Plant Fruit-trees in the Fields and Hedges.

As much profit may be made of *Fruit-trees* in *Orchards* and *Gardens*, so also by planting *Fruit-trees* in the *fields* and *hedges* of inclosed grounds: multitudes of *Fruit-trees* may be planted abroad in the *fields* and *hedges*, whereof great profit may be made, and yet without any considerable hindrance in any other respect, either of *Corn*, *Hay*, or *Pasture*; so that men may have a double or treble profit (or more) by this means, to what otherwise they have; after one *Harvest* is over, they may have a *second*, and that as great, or greater then the first; perhaps twice or thrice as good: That this may be, it is to be considered *what Trees are fittest to be planted there*, and in *what manner*.

Observe right kinds.

As to the *kinds* of *Trees* fit for *fields* and *hedges*: it will be best, especially now at first (until there be more *store* of fruits) to plant the *coarser and harder kinds of fruits*, that so people may not be eager of them to steal them.

The

The courser fruits very profitable.

There are many kinds of Fruits very course and *hard* at first gathering, which are exceeding useful and profitable, especially for *Cider* and *Perry*; some wild *Pears*, (as Mr. *Parkinson* observes) though no one will touch them to eat, yet they will make exceeding good *Perry*, hard to be discerned from Wine, when it hath lien divers years, and is throughly ripened; and so of divers kinds of *wild and Apples*. Let such therefore be planted in the hedges, on purpose for *Cider* and *Perry*.

Plant high Trees in Fields.

And as the *kinds* are to be thus observed, so also the substance and bigness of them; such Trees should be larger then ordinary, two *yards high*, or more at first planting, that so they may spread high, out of the reach of *Cattle*, and may not be troublesome to workmen about *Hay* and *Corn* in sommer time.

Defend them from spoyle.

Such being Planted, must have *two* or *three stakes* set about each of them; to *preserve* them from the robbing of the *Cattle*, and other *annoyances*; or else must have a *small hedge of Thorns* round about them, for some years at the first planting.

Manner of Planting in the Fields.

Fruit-trees in the fields, should be Planted a *large distance asunder*, not onely because this course will take up *multitudes*; but also (and chiefly) in regard they may not overmuch *shade the Land* whereon they are Planted, so as to prejudice *Hay* and *Corne*, *Pasture*, or other profits to be made thereof; so that these Trees should be planted 30 or 40 yards in *distance*, especially those in the *middle of the fields*, and also in *Rows* or *Ranks* throughout, that so the Plough may continue a straight furrow all along, from one end to the other; as we see in *Herefordshire*, *Kent*, and other *Fruit-Countries*; and Trees so planted (as we see by experience) will grow *exceeding large*, as great as three or four, or more of those that grow near together in Orchards.

Shade,

shade and droppings, no considerable prejudice.

If it be objected; That *Fruit-trees* so planted, will spoyle much *Corn* and *Grass* under and about them, by their *droppings* and *shade*: It is answered, that it hath been observed, that good *Corn* hath *grown* very near the roots of such *Trees*, almost as good as any where in the field, where no Trees are: and *grass* as much, or more under *Trees*, as where none are, although (perhaps) not altogether so sweet. Mr. *Hill* doth affirm it plainly, that fruit-trees regularly planted, do advantage the ground, *even in respect of grass*: See pag. 92. of the *Improver Improved*. And although it were granted, that neither *Grass* nor *Corn* would (at all) grow under *Fruit-trees*; yet *how* weak an *objection* is this, when the profits by the Trees may be an hundred, or perhaps two hundred fold, to what can be expected (rationally) upon such a quantity of Land (as they shade) in *Corn* or *Grass*.

Profit of Fruit-trees by Cider and Perry.

Multitudes of *Fruit-trees* planted in *Orchards and Gardens*, and in the *Fields*, and

bringing forth much fruit, the next thing is to make uſe of them to the beſt advantage; which is by *Cider* and *Perry*; eſpecially by *Cider*. Men may not onely ſtore themſelves for their own uſe *in their Families*, all the year, but alſo much for *ſale*, they may ſell the fruits to thoſe who convert them into *Cider* for advantage.

Cider more healthy then other Liquors.

Cider is more conducing to *health* and *long life*, then *Beer* and *Ale*, (though theſe are alſo good Liquors, eſpecially for ſome perſons) for *Cider* is a clear Liquor without dregs, and doth not onely not leave any dregs in the *body* of its own ſubſtance, but it hath a property to cleanſe the *body*, and open obſtructions carry down ſuperfluities and hurtful humours in the body, which other *Liquors* and *Meats* have ingendred and left in the body, which are the Seeds of many *diſtempers* and *diſeaſes*.

Long Experience, proves the healthfulneſs of Cider.

That it is very much *conducing* to *health* and *long life*, (beſides the Judgement of learned Phyſitians) *Experience* doth fully *prove it* in thoſe *places* where it is much uſed:

The story of a *Rich Landlord*, who would never let *leases for lives* to any that were *Cider drinkers*, is somewhat to the purpose: he concluded such were like to live too long, so was not willing to meddle with them upon such terms.

Mason Rust. says, that a famous *Physitian* in his time, was not content to equal *Cider* and *Perry*, with *Wine of Grapes*, but preferred them before it in every things.

In *Normandy*, there is abundance of *Cider and Perry*, where they esteem of it equal to *Wine*. *Legacy of Husbandry pag. 19.*

Windiness of Cider, only at first:

As to the *windiness* that some finde in drinking this *Liquor*, that is found to be only at first, until the body be used to it, after a time that ceaseth: An *Author* of good credit says, that *Beer* and *Ale* have the like operation to those who have not been accustomed to them, which afterwards ceaseth: we know *Tobacco* will make a man dizze, and somewhat distempered at the first taking, to one who hath not been used to it, but afterwards no such thing: so also in respect of *Cider*.

Cider of some Apples is Cordial.

But especially it will be less windy, and much more *pleasant*, *healthful*, and *cordial*, if it be made of the best kinds of Fruits: *Physitians* ascribe some *degree of heat* to some *Apples*, as *Pearmains*, and some *kinds* of *Pippins*. *Matth.* says, they are *Cordial to persons in hot diseases*: *Calidis cordis affectibus succurrunt.*

Galen. de Aliment, facul. l. 2. pag. 20. In Com. pr. Li. Dioscor.

Pearmains, Pippins, Moyles, Redstreaks, best for Cider.

Therefore, let the *greatest number of Fruit-trees*, not only in the *Orchards*, but also in the *Fields*, be of *Pearmains*, *Pippins*, *Gennet-moyles*, *Redstreaks*, and such kinds as are known by much experience, to be special good for *Cider*, and then the *hedges* and outmost bounds, may be of some *courser* and *harder kinds*, which also will make good *Cider*. *Cider* of the best Fruits, is not only *healthful*, but very *cordial*, is *found* to refresh the heart, and exhilerate and chear the spirits, is special good against *Melancholly distempers*, against the stone, and straight passage of the *water*, carrying down *gravel*, and clearing *obstructions* in the

the body: it *cleanses the stomack*, and *procures a good appetite to meat*, and makes a *good digestion*; which is *fundamental* to *health* and *long-life*.

Apprehensions of Good, makes men seek after it.

Were men but acquainted with the benefits and advantages of *this Liquor*, they would labour more for it: But we know, *Ignotum non desideratur, nisi cognitum*: Men can never desire a thing, unless first they know it, or have some apprehensions of the good of it.

Health and long-life.

Health, and *long-life*, are two of the greatest earthly blessings that all the world seeks after; and what will they not do, or give, for the attaining of them? As *Naaman*'s servant said to his Master, so it may be said here, if they should be required to do *some great matter*, for the attainment of *health* and *long-life*, would they not do it? Yea certainly, methinks, then they should not neglect such easie *terms* as are here proposed, when once they know them. Now it is concluded,

That *exercise in the work of planting fruit trees*, with *moderate use of Cider and Perry*, are the most effectual Natural means for these ends. See at large pag. 40, 41, &c.

Riches and Profits.

But besides, many other *profits* and *advantages* come by this labour in *Planting fruit-trees*, in *sale* of the *fruit*, *wood*, *cider*, *perry*, and other *commodities* of the *Orchard* all the year long; so that why may not this *Art* be called the *Philosophers stone*, which though it turn not *common Mettals* into *Gold*, yet it turns *Trees* and *Fruits*, yea *earth* and *dung* into *gold* and *silver* in a certaine time? Many men have laboured many years, and spent much *gold* and *silver* in seeking the *Philosophers-stone*, that so they might have gold enough, but all to little purpose. I think they were best to make use of this, till they find out better; this will help to beare charges in the seeking of it.

The Philosophers stone

But though this *Art* be not the *Philosophers-stone*, yet it hath the *properties of it*, or some like it, if not above it; for is it not more to turn *wood*, *earth*, (and the like) into *gold*, than to turn *Brass*, *Tin*, and such *mettals* into *gold*, which have some *likeness* to it already?

Let

Landlords and Tennants agree to Plant.

So then, Let men that have *Lands*, or any considerable *Estate* in them, be *perswaded* to *improve them* for their *own* and *others advantages*, and herein *Landlords* might greatly *benefit themselves*, their *heirs*, and *posterity*, if they would *encourage* their (a) *Tenants* to *plant fruit Trees* and *other Trees* upon their *Lands*, by assuring them, that so long they should enjoy the same so long, or such other *recompence*, as might be a sufficient *encouragement* to them to labour more about it; but when *Tenants* fear, and foresee that the more they *labour* herein, and *improve* their *Leases* by such means, the sooner they shall remove out of it, they have little reason to stirre a foot towards such a work.

(a) If *Landlords Covenant* with their *Tenants* in their Leases, to *plant Trees*, their livings will thereby be much improved in certaine years.

An increase manifold.

Hereby many *Estates* might be *increased manifold*, by many and great profits to *them* and *their* for many *Generations*. Sir *Rich. Weston*, in his *Legacy*, saies, *It is a thing much celebrated by Antiquity, and thought the noblest way to gather wealth, for to imploy much coin and money upon his Land, and by that means to Augment his Estate.*

Hus-

Husbandry the end of mens other endeavours.

One sayes, *If you observe the common course of things, you will find, that Husbandry is the end, which men of all estates in the world do point at: for to what end do Souldiers, Schollars, Lawyers, Merchants, and Men of all Occupations and Trades, toyl and labour with great affection, but to get money, and with that money, to purchase Land; and to what end do they buy Land, but to receive the fruits to live upon?* Now, this being the *most profitable, and pleasant piece of Husbandry*, doth especially challenge our labours in it, not only that we may *live*, but (as a meane) that we may *live in health, and live long*, to the praise of God, and service of our generation.

Nations subsist by Husbandry.

Though *Husbandry* (in all the parts of it) is but a mean imployment, in the account of many, yet we know by *Husbandry*, a *Land* or *Country* is maintained, even the *greatest* and *highest persons* in a *Nation*, generally; *Lesser* and *smaller matters*, facilitate and help forward the *greatest*: so that if the *higher powers* would please to enjoyne,

enjoyne, or encourage the people to *planting Fruit-trees*, and *all sorts of wood*, they would be better able to bear all *burdens* and *taxes* (whatsoever) that are imposed from time to time by Authority: and the *greatest*, and *most important affairs of the Nation*, will be much furthered thereby.

Cider and *Perry* are of great use in *long voyages at Sea*; and store of *Timber* might in certain years be raised for *building* of *Ships* of the best kinds of *Oak*, *Beach*, *Chesnut-tree*, and other kinds of Trees, whereby there might be a continual supply thereof, to this, and succeeding generations.

Plant Oak, Ash, Elme, and all sorts of Wood.

AND now I shall make some small digression, and stop a little aside out of the *Orchard* and *Garden*, to give a *word* of encouragement, and direction, for the planting of several sorts of *Wood* and *Timber*, especially *Oak*, *Ash*, *Elme*, and other useful wood for building, fire, and other purposes; (I have planted and ordered these *kinds of Trees* as well as *Fruit-trees*)

Here-

Hereby men may (by the blessing of God) exceedingly advantage themselves, their posterity, and the whole Nation: Besides the usefulness of the *Wood* and *Timber*, store of *Hogs* might be kept with the *Mast* (which makes their flesh very *sweet*, *fat*, and *good*) and some say *Sheep* and *Poultry* will feed upon the *Mast*.

Land not worth 2 s. an Acre, made worth 4 or 5 l. in few years.

The charge and labour is but small, but the profit in time (yea, in few *years*) will be exceeding great. Mr. *Blith* in his *Improver Improved*, affirms, that even *boggy land*, not worth above two shillings an *Acre*, by planting it with *Willow*, *Sallow*, and such like *Wood*, and draining of it deep, may be worth near five pounds an *Acre*, and that in 7 or 8 years. See pag. 160. of his Book.

Wood on good Land, worth 60 l. an Acre.

But upon better land, the *advance* and *profit* would be much more: Upon some warm good land, *wood* being *planted*, may be worth *threescore pounds an Acre*; and that in 11 or 12 years, and as much in fewer years afterwards: see the proof and experiment

riment hereof, heretofore made by Mr. *Cornwright* at *Billing* in *Northamptonshire*, *Improver Improved*, pag. 157, 158, &c.

An 100 *Ashes sold for* 500 l.

See the experiment of a *Gentleman* that planted an *hundred Ashes*, and lived to see them grow to that bigness, that he sold them for *five hundred pounds*, at *fifty years* growth: *Improver Improved*, pag. 163.

Fifty thousand pounds worth of Wood in an Age, by one man.

It is Recorded, that another Gentleman (together with his workmen) planted so much Wood in his life time, that he would not take *fifty thousand pounds* for it. See *Improver Improved*, pag. 163.

A necessity of Planting Wood.

Many more particular instances of Experiments might be brought of the *great profits of Planting Wood*, and but few men but see, and hear of advantages this way, so that we have encouragements enough to this *work*; especially if we consider the great *necessity* there is of planting all sorts of

of *Wood* in this *Nation*; *Wood* and *Timber* being destroyed and wasted every where, and grows very scarce and dear, and so will be more and more every year, unless men set in good earnest to this work.

It is desired the higher Powers would enjoyn this work.

And because men generally have been, and will be negligent in this great and important business, (through misapprehension of it, and carnal selfish Principles, for that they cannot reap all the *benefit* themselves) it is much to be desired that the *Higher Powers* would by a *Law*, or *Injunction*, set men to this *work*, which would be of exceeding advantage, to the present and future *Generations*.

Reasons for it.

1. First, because *Timber*, and *all sorts of Wood*, hath been of late times very much wasted and destroyed; and unless men set to this work, succeeding Ages will very much want timber for building *Ships, houses*, and other necessarie uses.

2. Secondly, by reason of the *great waste of Wood*, and no care to Plant more,

fuel

is grown *scarce* and *dear*, especially in many places, so that the *poorer sort of people* make lamentable moane for want of *fire* in cold long *Winters*, whereas by diligent planting, there would be fuel enough for all people.

3. Thirdly, except there be more *planting*, the *Tanners trade* (so necessary in the Commonweal) is like to fail very much: Bark is at a very great rate already, and grows yearly dearer, because scarce.

4. Fourthly, By planting Trees in the *grounds*, the fields would be much *warmer in Winter*, and *cooler* in *Sommer*; and consequently *Cattle*, and all *commodities* there, would prosper and come on the better.

Other Nations look more after Planting.

It is Recorded, That the *Romans* did in Ancient time, (and *Venice* at this day) appoint *Officers* on purpose to take care of the Woods, that there be Planting, as there is cutting down, and so a supply continually for all purposes.

There is a *Law in Spain*, that he that cuts down own Tree, shall plant three for it.

How

How to have great store of young Oakes, Ashes, &c.

Now, that men may have great store of *young Sets* and *Plants* to make *Woods* and *Groves*, or to plant in the *fields* and *mounds*, They must (in *Autumne*, when the Seed is ripe) gather abundance of *Mast* or *Acorns*, from the *best* and *straightest Oake Trees*; And also great store of *Ash keyes*, *Cycamore*, and *Mast* of the *Beach-tree*, and other seeds, * and sow these in ground *Plowed*, or dug up for that purpose, and keep them with weeding; and some may be drawn the first year, (others as they grow fit) to transplant abroad, and by this means, a world of goodly young Trees may be raised: Most *Ash-keys* will lie in the ground until the second Spring, and then come up abundantly.

* See how, pag. 79, 80, &c.

Elme Plants.

As for young sets of the *Elme*, many come up from the *roots* of Trees of themselves: But that we may have abundance, this must be done, Bare the *Roots* of some *Elme-trees*, and cut some of the *roots* (about a foot, or half a yard from the body) quite asunder,

under, and the same will shoot forth multitudes of young Plants (having small roots) which may be cut off with a Chisel or Knife, and planted in a piece of *ground*, in a *Nursery*, until they be grown big enough to Transplant abroad into the fields.

Cut not the Tops.

Cut none of the *tops* of any young *Tree* that you intend for *Timber*; for cutting the *top*, will make it spread too much: and besides, *Ashes*, *Sycamores*, and some other kinds, have wide great piths, and wet getting in, rots some part of the Tree, and hinders its growth.

Draw many, and leave the rest.

Out of a piece of ground sowed with *Mast* and other *Seeds*, abundance of *young* Plants may be *drawn*, and *enough left*, *which* need not at all be removed, but are to be *reared* up for *Timber*, or other purposes.

Willow, Osier, Withy, Sally, &c.

As for *Willowes*, *Osiers*, *Sallies*, &c. and such like, they will grow of cuttings,

Set in the Spring of the year.

long or short: The *Willow* (especially) is a very profitable Wood, and is of as speedy a growth as any whatsoever, it is profitable for firing, and divers other purposes. This must be planted on *moist land*: The worst *boggy land* (especially if *Trenched*) will become very profitable by this means. *Sallies*, and such as bear *Palms* early in the year, are not only profitable in the *Wood*, but also for Bees, in *hony* and *wax*; from which they have their first provision in the Spring.

Soyle best for a Plantation.

Concerning the *Soyle*, or *ground* for a Plantation of *Oak*, *Elm*, *Beech*, *Ash*, &c. We see by experience they will grow and thrive, upon almost any Land, but a *loose warm soyle* is accounted best, if it be shelving *upon the Sun*; upon such a ground they will thrive much faster, and the profits will be greater than on *cold clay moist ground*. Howsoever, plant any ground that may be planted, the profits will be great and many, to the present Age, and to Posterity.

And now I return again into the Orchard and Garden, and shall also speak somewhat further concerning Vine-yards, which (some are very confident) may be made here in England, *with very good success and advantage.*

Of Vineyards in England.

IT is Recorded, that many *Vineyards* have been formerly in *England*, and that *Tithes* have been paid (in some part of *Gloucester-shire*) of Wine, made of the *Vineyards* there. See Mr. *Hartlibs Legacy of Husbandry*, pag. 22, and 24. And that a Gentleman in the *Wild* of *Kent*, maketh seven or eight *Hogsheads* yearly of his own *Vines*: that he hath one *old Vine* upon the *Walls* and *tiles* of his House, that yieldeth *English* an *Hogshead* of Wine in a year, p. 26.

Camdens *Testimony of Vineyards in England.*

Camden in his *Britannia*, pag. 357. says, That *William* of *Malmesbery* writes, *That there is no Country in all England, so thick set with Vineyards, as Gloucester-shire, nor so plentiful in increase; the Wines thereof made affect not their mouths that drink them, with any unpleasant tartness, as being little infe-*

viour in ſweetneſs and odor, to the French *Wines.* And Mr. *Camden* adds, *That this is the Reaſon why many places in that Country, and elſewhere in* England, *are called Vineyards; And that it may ſeem to be the ſloathfulneſs of the People, rather then any indiſpoſition of the Aire, that this Nation yieldeth not Wine at this day.*

Mr. Parkinſons *Judgement of Vineyards in* England.

Howſoever, Mr. *Parkinſon* in his *Paradiſus Terreſtris*, pag. 553. tells us, he thinks it would be a fruitleſs labour to ſtrive in theſe dayes, to make a good *Vineyard in England*, for that years are not now ſo hot as formerly; And he brings experience in to witneſs the thing: *That divers, both Nobles and Gentlemen, of late times, have endeavoured to plant Vineyards, and brought over Frenchmen to do it, but could never make any Wine that was worth the drinking, being ſo ſmall and heartleſs, that they ſoon gave over their practiſe.*

And alſo, One ſays in *Camdens Brit.* pag. 269. *That we have had Vines in Britain ſince* Probus *the Emperours time, rather for ſhade than fruit.*

Now men have heard the Judgement

of

of Writers, and what is Recorded concerning *Vineyards in England*, they may do as they see cause.

A Vineyard must have all advantages with us

It is very probable, that if some special *Vines*, that ripens their *Fruits* early (as some do with us) were planted with all the *advantages* that may be (as upon the *side of an hill*, upon the *South-East* Sun, upon a *hot sandy soyle*, the *Vines kept short and low*, within a *yard of the ground*, and the *ground* kept *bare without weeds or grass*; it's likely, I say, (thus planted and ordered) they would afford good Wines, even with us in *England*. Or if *Vines* (some early kinds) be planted upon the *South-sides* of *Houses*, or *Morning Sun*, and spread upon the Tiles, no doubt the *Grapes* will make good Wine: but I verily believe, that *Vines upon level ground*, without the advantages before mentioned, will not bring forth *Grapes to perfection*; it's likely such would make very good *Vineger* or *Verjuice*, better then that of *Crabs*.

An experienced way for good Wines.

But seeing we have such a known *Experienced way*, to make *good wine in England*

of *Pearmains*, *Pippins*, *Moyles*, *Redstreaks*, and other Fruits, we need care the less for *Wine of Grapes*: the best that is said of the *Wine* that hath been made in *England* of *Grapes*, is, *That it hath been little inferior in sweetness and odor to the French Wines*: but the commendation of *Wine* made of the *best Apples*, is far higher; *viz. That it hath been esteemed by good pallates, not inferior to the best Wine of Grapes*, (all things considered) yea, hath been preferred before it. See pag. 145.

Hereafter follow divers Experiments and Observations (promiscuously) without dependance one upon another.

1 *Make some Wall-trees, Dwarf-trees*

IT is good to Plant some *Apricot-trees*, *Peach-trees*, *Fig-trees*, and other kinds of Trees (which we use to Plant against a wall) upon *Standards*, to grow somewhat *low*, as *Dwarf-trees*, if it may be upon the side of a *South-hill*, *Experiance* shews the Fruit will come to ripeness, but be somewhat *later* and *smaller*: however, this saves abundance of labour and time, and some cost in pruning, and nailing the *branches* to the wall yearly. The *Fig-tree* bears an excellent *cordial fruit*; it doth sensibly refresh the Spirits after eating, but eat mode-

moderately, leſt they make the blood to abound overmuch.

2 *Keep the ground bare under and about them.*

If the ground be kept *bare* with *diging*, or *paring* often, the fruit will be the *fairer* and ſooner ripe, the reflection of the Sun from the bare earth, will be almoſt as ſtrong as from a wall, eſpecially if beaten down hard after digging.

3 *Wet ground bad for Trees.*

Moiſt, wateriſh grounds, are bad for Fruit-trees, they *chill the Roots*, and *cauſe* moſs upon the Trees, and make the *Fruits* more cold, and on a worſe *taſte*, then the ſame kinds on *drier grounds*: but if Trees muſt be planted on ſuch grounds, lay them as dry as may be, by *ditches* and *trenches*, in ſeveral places.

4 *Helps to Fruit-trees in bearing.*

It will advantage *Trees* in *bearing* (old *Trees* eſpecially) to put *Pigeons dung*, *Lees of Wine*, with ſome *Aſhes*, *Brimſtone*, or the like, to kill *worms* about the *Roots*; or to put ſome *blood*, or *pieces of fleſh*, to their *Roots*: alſo ſtale Urin mixed, is very *good* for them, but yet beware of uſing too *great a quantity* of theſe hot things at one time, ſome Trees have been quite ſpoiled with *blood*, and ſuch like, in not obſerving therein a meet *quantity* and *ſeaſon*: *Wine* and *hot waters* refreſh our bodies uſed *moderately*, but otherwiſe are hurtful: a man may be killed with *Cordials*, if immode-

rately taken, so of all other *Creatures*. Also to water *Trees* in *blossoming* and *knitting* time, makes them hold their *fruit* better.

5 *Take heed that Pismires, Efts, and such like, be not about the Roots.*

If Trees thrive not, nor bear well, one cause (among many others, and not so much observed) may be, for that some *hurtful creatures* may *breed*, and *lie about their Roots*; as *Pismires*, *Toads*, *Efts*, and such like. One digging about the *Roots* of a *Tree* that did not thrive well, found a very great multitude of *Efts*, a great nest of them lying at the *Roots*, which undoubtedly was the cause of the *pooreness* of the *Tree*: so of other such like *creatures*, therefore once in 3 or 4 years, it's good to dig and turn up the earth about the *Roots*, especially of old *Trees*; and withal, to put in some dung *throughly rotten*, or *fresh earth*.

6 *Fruit-trees advantage Grass some wayes.*

Fruit-trees planted in the fields, make *Grass* to *spring earlier in the year*, by reason they cause *warmth*, and in a *hot summer* they shade the *grass*, when it is burnt up in some other places: also, they cause much grass under and about the *Trees*, which benefits and advantages, do more then recompence for the sowerness of such grass, as some suppose it to be.

7 *Fruit-trees profitable many ways.*

The profits of *Fruit-trees*, are in many respects, not only by the *fruits*, to be *eaten* all the year long, with *Cider*, *Perry*, &c. but

much *fuel* for the *fire* may be had from them in the *Prunings*, and by *old trees* not bearing; beſides, the *wood* may be *ſold* at a great rate to *Joyners* and other workmen, to make *Chairs*, *Tables*, and many other *Commodities*.

8 *Helps for barren Vines.*

Some *Vines* ſhoot forth exceeding large bunches yearly, but bear little: in ſuch a caſe, *bare the Roots*, and cut off a Mr. *Root* or two from the *Tree*, then lay ſome *Sand*, *Aſhes*, or any *hot barren ſoyle* to the Roots, this will abate the redundancy of the Sap, and conduce to bearing Fruits.

9 *How to keep Grapes.*

Grapes may be kept many weeks after the uſual time of laſting, if a *Branch of a Vine* be drawn into the houſe (eſpecially where a fire is kept uſually) and nailed up with the Bunches of *Grapes* upon it; or if Bunches (when ripe) be cut off with ſome of the *wood*, and hang'd up in a *warm room* where a fire is kept, with papers about them, to keep them from duſt.

10 *Much profit by Planting in one Age.*

If *School boys* and others, while they are young, ſet upon *planting Oaks*, *Aſhes*, *Elms*, and other *Trees*, they may probably (as others have done) make uſe of them for *building*, *ſale*, &c. even themſelves in their own *perſons*, unto exceeding great profit. See the Experiment of a Gentleman that planted a certaine number of *Aſhes*,

and

and at 50 years growth sold them for 5l. a Tree, pag. 126.

11 *Remedies against Conies, Mice, &c.*

If *young set Trees* are in danger to be *bark't*, or hurt by *Conies*, then stick round about the bottome of the Plants, some *Furz*, (three or four branches) as high as a *Cony* can reach, and they can never touch those Trees: And if *Mice* anoy, or hurt any *Seed-beds*, or the like, then stick, or lay down *Branches of Furz* round about the *Bed*, as close as can be to the ground, and the seed will be safe; else lay *Ratsbane* for them, mixed with bread and butter.

12 *To have Cherries & fruits late.*

Cherries, *Plums*, and other fruits, may be had after their ordinary times many weeks, when others of the same kind are gone, if means be used to keep them back; *as covering a Dwarf-tree, with a piece of rough Canvas, or other Cloth in Sommer, and wetting of it, to keep the Tree and fruits cool* in a hot day.

Or Secondly, to Plant a *Fruit-tree*, (that naturally bears fruit late, as the *great bearing Cherry*, and some others) upon the *North-wall*, where the Sun beams come not: Trees thus ordered, will bring forth their fruits very late, when all others are gone; and such will be as rare, and acceptable, as those that were extraordinary early: I have known *Cherries* on a *Tree*,

Tree, about the middle of *October*, and some in the next Month, about the *middle* of *November*: Also compass a small *Tree*, or *bough* full of *Cherries*, with a *Net*; this preserves them from *Birds* and from *Snails*, which otherwise can hardly be *kept* long. *Cherries in November.*

Snails do much mischief to Trees and Fruits, in the *Spring* and *Sommer*, so that as a remedy, care must be taken (besides picking up, and killing many of them) to keep the *Garden* clean, as may be from *weeds*, under and about which they harbour, and also all the *holes* and *chinks* in the *walls* must be stopt, and poynted with *Lime*, that they cannot get in to lie in the day-time: And withal, (to save some special Trees or Flowers from Snails) strow round about some *sifted Ashes*, the snails cannot creep over it, especially when the *Ashes* have been lately strawed. 13 *Destroy Snails in Gardens.*

We may have Fruits grow within the *house*, if a *branch of a Vine*, *Cherry*, *Aprecot-tree*, &c. be drawn in at a window, and nailed up upon the seeling of the house, or other place, where it may be preserved from breaking. 14 *To have fruit grow within doors.*

Or to set a small *Cherry-tree*, or other kind of Fruit-trees in an *Earthen Pot* or *Pan* (with a hole or two in the bottome, that

that overmuch *Rain* or *moiſture* may not reſt in the *mould* about the *roots*) this may be ſet in any place of the *Garden*, and taken into the houſe at pleaſure, with *bloſſomes*, or *fruits* upon the *young Tree*.

15 *Apples that have lyen a certain time make the moſt pleaſant Cider.*

If *Apples* be *ſuffered* to lie a certain time after gathering (being ful ripe) before we make them into *Cider*, the *liquor* will be more *pleaſant* and *delicate*, then if the *Cider* were made *immediately* after the fruit is gathered (though that be a good way too) becauſe in *lying*, (and ſomewhat heating together) the more wateriſh part flies out, and that which remains, is better concocted, and ſo more pleaſant.

16 *Tun up Cider as ſoon as may be.*

After the *Liquor* is preſſed out into *Veſſels*, let it not ſtand, but tun it up with all ſpeed, for the *Aire* in a little time, draws out much of the ſpirits of the *Liquor*, and *dulls* the reſt. We know *Wine*, or *Beer*, or any *Liquor*, if it ſtand open in a *Cup*, or *Glaſs*, though but half an hour, (or a ſhort ſpace) they looſe their *beſt ſpirits*, and become deadiſh or flat; and ſo of any other *Liquor* according to the time it is expoſed to the *open Aire*, though not ſo much while it is new, as afterwards.

17 *What flags are beſt to bind withal*

Thoſe *Flags* are beſt to uſe for binding of *Grafts* and *Buds inoculated*, which are *three-ſquare*, of a brown *colour*, of a *middle*

ſize;

ſize: the bigeſt are too *hollow* and *ſpungy*, and the leaſt are ſomewhat too *ſmall* and *weak*: They are to be had at the *Mat-makers* at all times of the year, or elſe they may be cut out of the ditches, and dried in Sommer, and laid up to uſe as occaſion is: In hot and dry weather in grafting time, cut them a convenient length, and tie many of them cloſe together, ſo moiſten them, and thus they will keep moiſt, and bind well in grafting.

It is very *ſuccesful* that we *proportion* *Grafts* and *Stocks* in *Grafting*: That is, to *graft* the *bigeſt Grafts* upon the *bigeſt Stocks*; and the *lower* we *Graft-ſtocks*, (if they be for *Standard-trees*, as *Apple-trees*, &c.) the ſhorter the *Grafts* need to be, becavſe all muſt be cut off, except only *one ſhoot* to grow up, to make the body of the Tree, ſo that a ſhort *Graft*, of 2, 3, or 4 buds for ſuch low *ſtocks* is ſufficient, unleſs we intend thoſe low *Trees* for the *Wall*, or for a *Fruit-hedge*, as is ſhewed before: if ſo, it's better to *graft* upon ſuch *low ſtocks*, *longer grafts*, of 6 or 8 buds, that ſo it may have many *ſhoots* and *branches* to ſpread. 18 *Fit Grafts and ſtocks in bigneſs.*

Such as have many to *graft*, and cannot do all the work in the beſt Seaſon, may cut as many as they will, and keep them 19 *Cut Grafts in due ſeaſon.*

them in the ground, laid half way or more in the mould, (in a shady place is best) and so we may be grafting till the end of *April*, and afterwards, when it is too late to cut *Grafts*.

20 *Seed-stocks better then Wood-stocks*

Many get *Crab-stocks* out of the *Woods* to *graft* upon for an *Orchard*, but those kind of *stocks* are not (by far) so good, as such as come of *seed* or *kernels*, for many Reasons that might be shewed: they for the most part, grow *poorly*, if they grow at all (for very many die out right,) whereas Plants coming of Seed (and ordered as is shewed, pag. 83.) grow vigorously, and seldome fail, as having better and more Roots then the other; and besides, they have an Innate Spirit (from the Seed whereof they came) which makes them grow better then *slip-plants*, from *Woods* or *Roots of Trees*.

And also they are worse then *Seed-plants*, because they being commonly *great ones*, must be *grafted* in the *Cleft*, which often occasions rotting of the heart by wet getting in before the *Graft* can cover the head of the *stock*: whereas *Seed-plants* being young, may be *grafted* by *packing* on, as is shewed pag. 96. and so are found *Trees*, without any rotting at all: Also *Seed plants* are commonly more *trim*, *straight*

straight and *handsome*, then *Wood-stocks*, and to be preferred before them in these and other respects.

21 *Weed the Nursery.*

In the *Spring* and *Sommer*, keep the *Nursery* (of young *grafted Trees* and *stocks*) clean from *weeds*; rake up all the *weeds* in divers heaps, (being pluckt up) and let them lie till they be dead and withered, and then scatter them about again; for as it will be much labour to carry them off the ground, so also it will much impoverish it, seeing it must be *weeded* often in *Sommer*.

22 *Cut not off side-branches too soon.*

Young Trees that are grafted low, and not are to make *Standard-trees*, these must be pruned up, all the side *branches*, a yard or an Ell high, or as high as men please, according to the place they are to be afterwards set in; but in pruning, take heed of cutting *off* the *side twigs or branches too soon*, before the *body* be grown somewhat stiff and strong, able to bear a fair head: for otherwise it will be too top heavy: if the *side branches* be cut off too soon, the body will be weak and slender, and the head bushie, and too heavy for the body, and so cause the Tree to grow *crooked*.

23 *How to get Boughs with Roots from Trees.*

Boughs of 2, 3, 4, or more years *growth*, may be taken from some *Trees* with *Roots*, to be planted in other places, as *Dwarf-trees*,

trees, or in a *Fruit-hedge*: Thus, sometime in *May* or *June*, take off the bark of a bough, about an inch in breadth *round about*, cut it above and below, and take off all the bark between the two cuts, then take an *old hat*, or some *old rag* or *cloth* (or any thing that will hold mould) and tie it a handful, or more, below the disbarked place, then fill it up with some good *earth* or * *mould*, as much above the disbarked place, as *below*, and let the *mould* be as much on one side of the branch as the other; afterwards water the mould, and keep it *moist* all Sommer, by pouring in some water now and then: And in *Transplanting time*, this bough may be cut off below the disbarked place, and set elsewhere in good mould, which will bear in a year or two, it may be in the next *Sommer* after, if it Root well: Now observe, this cannot be done upon every Tree, no kind of Stone-fruit, neither *Aprecots* nor *Peaches*, *Plums* nor *Cherries*; nor so well upon many kinds of *Apples* or *Pears*, which are of the *harder* sort

* Or otherwise it may be done thus: About *Midsommer* take away the bark, as before, then put round about the bare place, some Earth, wherewith some *Hay* or *Grass* is mixt, to hold it together, then wrap it round about with a *Hayband* all over, and in removing time, cut off the bough below, and set it with all the mould and bands, take away nothing of it.

sort of Fruit-trees, but it may be effected upon all kinds of *Quodlings*, *Nurſ-gardens*, *Quinces*, *Gennet-moyles*, and ſome other kind of *Apple-trees* that are of *more* ſoft and porous barks, which more eaſily put forth or ſome *knobs* or *roughneſs* which turn to *Roots* afterwards.

And although there be *Fruits* upon boughs when they are ſo disbarked, yet the fruits come to good perfection, and the *branches* make a convenient growth the ſame year, for the ſap paſſeth up through the *pith* and *pores of the wood*.

Thoſe Beds that are ſowed with Seeds, of any kind, (*Apple-kernels*, *Pear-kernels*, *Plum-ſtones*, *Cherry ſtones*, &c.) muſt be looked unto, not onely that *Mice* devour them not (as hath been ſaid) but alſo that they lie not *above ground*; for though they be all covered when they are firſt ſowed or ſet; yet we ſhall find after a certaine time, the Rain that falls, will have waſh'd off the mould from ſome of them, which will lie *on the top bare*; therefore take a ſtick, or ſomething elſe, and thruſt thoſe ſeeds or ſtones, (that ſo lie bare above *ground*) into the *mould*, an *inch* or half an *inch*, *otherwiſe* they are in *danger* to be *loſt*.

24 *Look that ſeeds lie not above ground.*

In ſetting young Trees (of any kinde) take heed of ſetting the *Roots* too deep,

25 *Lay dung upon the Roots of new ſet Plants.*

there is advantage in setting *shallow*, if this course be taken; That is, after the *Roots* are well placed, and spread every way, and covered with mould, then lay round upon the *Roots*, (close to the body of the Plant) a barrowful of *rotten dung*, or any *fat soyle*, or (for want thereof) some *Litter*, *Straw*, *Hay*, *Weeds*, or any such like *stuff*, upon, and round about the Roots; if it be half a foot thick, or more it is better: This, as it keeps the *roots warm in Winter*, and *cool* and *moist* in *Summer* following; so also it adds fatness to the soyle where the Trees are set, and preserves them from *weeds*; or if any *weeds* grow, pluck them up, and lay them upon and about the Roots of the new set Plants, more the better. This course we see by *experience*, is exceedingly conducing to the growing and thriving of Trees newly Planted, many die for want hereof, or grow very poorly.

26 *Leave a Bud on the outside.*

In cutting of *Grafts*, it is good to leave a bud or two on the outside of the cut place, that in case any of the *Grafts* happen to be broken off, such Bud or Buds on the outside, will spring out, and supply the defect, notwithstanding the *Graft* be broken off, even to the top of the Stock, as I have often observed; but some *Grafts* broken

broken for want of such a Bud, have been utterly spoyl'd.

Seeing it is certain (from *experience*) that many Fruits coming of Seed, and were never *Grafted*, do make excellent *Cider*; and as many judge, the *best Cider*, (the famous *Redstreak* being such a one, even but a *Wildings*) it is *good* therefore to sow some principal good Seed of *Apples*, and to Nurse up the Trees to bearing Fruits; whereof we may have several sorts of special *Cider-fruits*: And if any happen to be too near the degree of *Crabs*, then *graft* such with other good fruits. 27 *Preserve some ungrafted Trees for Cider.*

By setting or sowing of *Acorns* or *Mast*, *Ash-keys*, *Cycamore-keys*, *Chesnuts*, *Seeds* of *Maple*, *Beech*, *Thorn*, and such like, men may (if they will be diligent herein) by the blessing of God, exceedingly advantage themselves, their posterity, and the *whole Commonweal*: Hereby there would be (in certaine years) *Wood* and *Timber* enough for *building of Ships*, *Houses*, and also for *Fuel* and all other purposes: That poor people (as well as others) might have enough in *cold long Winters*, and not *cry out*, as being almost starved for want of *Fire*. Hereby would be sufficient *Bark* for *Tanners* at a cheap rate, and consequently all sorts of *Leather* (which is now exceed- 28 *Sow Acorns, Ash-keys, and other Seeds.*

ing dear) would become much cheaper.

Hereby would be young Trees, sufficient to Plant the Fields round about, not onely to make good *Mounds*, but also the same would make the *Fields* much *warmer* in *Winter*, and *cooler* in *Sommer*, whereby all sorts of *Cattle* would prosper, and come on the better, and all other *Commodities* growing therein, to the great advantage of the *Owners*, and the *Commonweal*.

So then, the *Profits by Planting Fruit-trees*, and *these other Trees aforementioned*, would be many and manifold, more then I am able to declare.

Obser-

OBSERVATIONS

Upon some part of

Sr. *FRANCIS BACONS*

NATURAL HISTORY,

As it concerns

Fruit-trees, Fruits, and Flowers:

Especially the

FIFTH, SIXTH, and SEVENTH

CENTURIES,

Improving the Experiments mentioned, to the best Advantage.

By *RA. AUSTEN*, Practiser in the *Art of Planting*.

Gen. 2. 8. *And the Lord God planted a Garden Eastward in Eden, and there he put the man whom he had formed.*
And out of the ground made the Lord God to grow every Tree that is pleasant to the sight, and good for food.
Gen. 1. 29. *And God said, behold, I have given you every herb bearing seed, which is upon the face of all the Earth: and every Tree, in which is the fruit of a Tree bearing seed, to you it shall be for meat.*

OXFORD,
Printed by *W. H.* for *Amos Curteyne*, 1665.

UMI

Good Reader,

THE Author of this piece hath always thought fit (I disclaime any worth in me that may deserve it) to give me leave some time before every Impression to make a judgment of what in this Nature he hath published.

But now bearing Reverence to the Greatness and Honour of the Person (without Controversie for that Constellation of Learning and Nobility in him, none of the least credits of our Nation) with whom he is now seen, was desirous, that I should not onely tell him, (which at other times served the turn,) but the Reader also, my thoughts concerning this his adventure. Which are, that no man ought to judge him presumptuous in this particular; I take him to be such, who hath more

mind to communicate to the World (for publique profit) what he has found by tryal certain, than to make a book; and indeed an Witness my self to the Truth of most of his Experiments; the subjects of which no man dares call too low for the Pen, that remembers the Author whose Writing first gave occasion to these Animadversions.

The Nature of things, Causes of their Generation, and of all appearing effects in them, is confest to be a dark Theme, and for ought I know, many questions thereabouts are not likely to be concluded, especially to the conviction of Gain-sayers, till Anaxagoras, Epicurus, Aristotle rise again: A little time by Gods Providence I have been continued in the world, some small pittance of which hath been laid out in that search: I dare not say that I have been ascertained of the adequate, and true causes, with their manner in Causation of any of those Vulgar appearances which are in all mens Eyes, after the best state that I can make in this subject. Fortasse non, if opposed, may put me to a blanck; nor am I confident of any mans Wisdome that concludes affirmatively more than this, That such an effect may proceed in such a manner from such a Cause: Sometimes in many Opinions we have no probable causes assigned, but when many probable,

than

than 'tis hardest of all to prove which is true: This I speak to take off the exceptions of such who are otherwise perswaded than our Author declares himself, when the question is concerning causes, as in the 481. Experiment: My Lord Bacon seems to maintain Anaxagoras his opinion concerning the way of generation and augmentation, per homoiomeriam, Mr. Austen Aristotles, I'le not be bound that in a severe judgment the Master of our Schools shall have the sentence on his side: Yet we find few better Instances (then Mr. Austen brings) to explain how out of one nature (if indeed there be but one) in the juice drawn through the roots to serve several Grasts upon the same stock several natures may be made. Others may likely be offended at his refusal to attribute many effects to the descention of Sap; which whoever does, I give him leave to blame me too; for I have long believed the opinion of descention of Sap in Trees, a vulgar Error, and have always encouraged him to publish his arguments to the contrary. There may be others ready to stumble at other things, but if it be in matters wherein we are so much in the dark, by my consent for all mistakes we will interchangably beg, and give pardon: his arguments to me are all especially commendable in this, that they smell more of the Garden, than Library, see p. 100, 101, &c. of his Treatise of Fruit-trees.

If

If therefore my judgment must be made, I can't but commend him heartily, and his example to all, exercised in any like ways, and doubt not but that it would be mightily to the advantage of knowledge in Natural Philosophy, *if even all to the lowest of* Mechaniques *would communicate the mysteries of their* Arts. Interest *indeed hinders most, and so 'tis like to do, from making any thing valuable common. But 'tis* Heroical *and* Noble Charity, *when there's nothing but* Self-interest *hindering, to deny that for the* Publique good: *I believe the Author expects to himself no Attributes of so high Qualities. I wish he may always have his due, at least from*

(Good Reader)

His and Thine, to
serve thee,

R. SHARROCK.

L.B. novi Col. Soc.

To

TO THE
READER:

COncerning my undertaking this ensuing work, I give this Account: It may (perhaps) by some be thought too bold an attempt in me, to examine the Writings, and to Recede (in any thing) from the Judgement of so *Eminent* and *worthy an Author*: To which I *Answer*, That what I have here done, I doubt not, but if the *Author* himself were now living, he would approve of it: But more particularly, let it be considered, that those things which I have to do with herein, are directly within the compass of my *Calling* and *course of life*, about which I am daily con-

converſant: And the *Author* hath given to my ſelf and others, ſufficient encouragement in this: Having ſaid (in his Advancement of Learning) *That the Writings of ſpeculative-men upon active matter, ſeems to man of experience, to be but as dreams and dotages: And that it were to be wiſhed, (as that which would make Learning indeed ſolid and fruitful) that active men would or could become writers:* Men that have *experience* in *things*, are like to *ſee into* the *Myſteries* & *ſecrets* of *them*, *more* and *further*, then ſuch as have *notions* and *apprehenſions* of them without *action* and *practice*. It is concluded, and laid for a ground, That *peritis credendum in ſua Arte:* Men are to give *credit* to *Artiſts* in their *own* faculty. And further *obſerve*, that *many of the enſuing particulars*, are but only *Queries* ſet down by the *Author*, wherein not having experience, he deſired further light from it; which I have endeavoured herein to reſolve; and wherein I have perceived a manifeſt miſtake, I have (for the *Truths* ſake, and *profit of men*) diſcovered it. I hope, without any *reflection* upon the *Worthy* and *Learned Author*, who I verily believe, would have encouraged any *Experienced man*, in the like undertaking: not ſeeking himſelf, (as he * profeſſeth) but the *truth* in theſe things, for the *good of future Generations*.

* In his Epiſtle to his Natural Hiſtory.

Let

Let it be obſerved alſo, That the *Experiments* ſet down by the *Author* in his *Natural Hiſtory*, are of two *ſorts*, as himſelf ſaith: *Experimenta Fructifera, & Experimenta Lucifera*: *Experiments* of *Light* and *Diſcovery*, (ſuch as ſerve for the *illumination* of the *underſtanding*, for the finding out, and diſcovering of *Natural* things in their *Cauſes* and *Effects*, that ſo *Axioms* may be framed more ſoundly and ſolidly) and alſo *Experiments of uſe* and *profit* in the lives of men.

Now, the *Obſervations upon theſe Experiments*, tend alſo to the ſame ends. I have endeavoured to improve them for moſt advantage, and therefore have ſo much *enlarged*, eſpecially upon many of them, and where I have been more brief; and the thing required further diſcovery, I have referred to it in my *Treatiſe* of *Fruit-trees*, where it is ſpoken too more fully.

And that there may be a brief view of what is contained in the enſuing *Experiments* and *Obſervations*, I have ſet down the chief particulars in the Table following, of which I recommend to thy

Uſe, for thy Profit,

R. AUSTEN.

OBSERVATIONS

Upon some part of

Sr. *FRAN. BACONS*

NATURAL HISTORY.

The V. CENTURY.

WE *will now enquire of Plants or Vegetables, And we shall do it with diligence. They are the principal part of the third days work: They are the first Producat, which is the word of Animation; for the other words are but the words of Essence: And they are of excellent and general use for Food, Medicine, and a number of Mechanical Arts.*

Experi-

Experiments in Consort touching the Acceleration of Germination.

Experiment 401.

There were sowen in a Bed, Turnip-seed, Wheat, Cowcumber-seed, and Pease: The Bed we call a Hot-bed: Horse-dung (such as will heat when laid together) laid a foot high, supported on the sides, and mould laid thereon two or three fingers deep. The Turnip-seed and Wheat, came up half an inch above ground, within two days after, the rest the third day: This is a noble Experiment, for without this, they would have been four times as long in coming up. It may be tried also with Cherries, Strawberries, and other Fruits, which are dearest when they come early.

Observation.

Though a *Hot bed* conduce much to the *speedy springing up* of *Seeds, Stones, Roots, &c.* yet the *end* cannot be attained hereby; (they will not come to ripeness earlier then others for profit) unless there be a continuance, and concurrence of *Causes* from *first* to *last*, all along, without intermission: For the *hasty* and *sudden springing up* of *seed* upon a *Hot-bed*, is but a forcing of Nature for a little while, and serves to excite for the present, *while the heat continues in it*; but what shall carry on the

springing and *growth* of these things to perfection, when the *heat* of the *Hot bed* is over: surely as the *Cause* of springing and growth becomes *weaker* and *weaker*, and at last cease altogether, so also will the *effect* of that *heat*, that is, *The growth of the Plants.*

Steeping of Wheat in fat Waters and other Liquors, is a rich Experiment for prove the goodness of the Crop answer the earliness of the coming up, &c. Experiment 402.

Steeping of Seeds, Kernels, Stones, &c. is chiefly to excite the spirit of the *kernels of seed*, and to make them the sooner and more easily to open, & spring up out of the earth, which some kinds have much need of, as *Aprecots*, *Almonds*, and other thick shelled stones. Observation.

As for *Wheat*, and such like *seeds*, steeping will excite the spirits, and open the outer parts, and hasten their springing up; but I conceive the *vigour* and *virtue* (got by such *steeping*) will be soon gone, it will not be lasting, as the *natural property* of the *seed*; Whatsoever is natural, in *Seeds*, *Plants*, &c. doth continue, and cannot fall off, or be lost; but that which is accidental and from *Art*, is but of short continuance, and soon over; (like the virtue of a *Cup of Wine*, or a *meals Meat* to

our bodies) so that the end will not be attained, unless the same help be renewed, and often repeated, by watering of such *steeped seeds*, with the same *Liquor*, from time to time, till they come to perfection.

Experiment. 403. *Strawberries watered now and then, (at once in three days) with water, wherein hath been steeped Sheeps-dung, or Pigeons-dung, will prevent, and come early.*

Observation. This is a good *Experiment*, and profitable to make the *Berries* earlier and fairer; so it be seasonably and moderately done. I conceive the morning is best, before the Sun be hot; but water them not *too often*, nor *too much*, lest it make the ground too rank and *fat*, which is not good for *Strawberries*; it makes them commonly run into great leaves and strings, and to bear Fruits less.

Experiment. 404. *Dung, or Chalk, or Blood, applyed in substance, (seasonably) to the Roots of Trees, doth set them forwards*, &c.

Observation. Too great a quantity of these things will hurt, especially young *Trees*, as the best meats and drinks, immoderately and unseasonably taken, hurt men: *Blood* or *Flesh*, or the like, applied to the Roots of old *Vines*, or other Fruit-trees, being decayed or old, will refresh them greatly: Let this be done before Winter, or in Winter time,

that the virtue thereof may soke into the Roots, and the Earth about them before the spring: And also that it may not be noysome or offensive in Spring, or Sommer after: Dig up the earth, and bare the Roots as much as may be, and poure in the Blood, or lay the Dung, Flesh, or any fat substance to the Roots, afterwards cover it with the mould all over: Otherwise take a Barre of Iron, and make many holes among and about the Roots of old Trees (especially where the ground is bad) and poure in blood of Beasts, fat water or such like; this will much refresh the Trees.

Fruit-trees upon a South, or South-east wall, will bring forth their fruits early. *Experiment.* 405.

It is true, that the *South wall* is best, and the *South-east* next, to Plant choice Trees upon to come early; the Reason why the *West-wall* is not so good as the *East*, for *early budding*, and *ripening of fruits*, I conceive is mainly, because there is usually more rain and moisture, and greater and more winds out of the *West*, in *Spring* and *Sommer*, then out of the *East*, which do much cool the Trees and Fruits, and so *retard*. Also *May-Cherries*, or other kinds, which naturally bud, and bring fruits early, being planted (as is here said) against the *Observation.*

back of a Chimny where fire is much kept, the same will bud, and bear very early in the year, especially if the wall be of brick, and but a thin wall.

Experiment. 406. *Digging, and loosening the earth about the Roots of Trees, accelerate Germination.*

Observation. This culture is undoubtedly a benefit to Trees, as to their *increase and growth*: they will *thrive the faster hereby*; but I conceive not as to accelerate *Germination*, to hasten *early budding*; for all Trees bud forth before they draw one jot of Sap out of the earth in the Spring: there is Sap existing in the buds and branches all the Winter, which is excited by the Sunnes drawing near in the Spring time, and breaketh forth into blossome and leaf; and by degrees Sap riseth to carry on springing and growth.

Experiment. 407. *A Damask-Rose-tree in water, budded in the space of ten days in a Chamber.*

Observation. I conceive this Acceleration was not for that it was set in *water*, but because the air was somewhat warmer in the house, then out of dores at that season, it being in *October*; it would have done as much if it had been set in earth: And as for the difference betwixt this, and that with the Horse-dung mixed; it may be that Rose-tree in water onely, had the better and

more

more *Roots*, which would certainly cauſe budding ſooner.

A Dutch Flower that had a bulbous Root, was put under water, and within ſeven days ſprouted, &c. Experiment. 408.

I have tryed ſeveral Flowers with *Bulbous Roots*, and other kinds of *Roots* in water in the houſe in *Autumne*, which kept freſh, and ſeemed to come on ſomewhat for a while, but afterwards flag'd and faded; I know no advantage that may be had hereby at that ſeaſon, for the Aire (in a while) grows chil and cool, even within doors, and ſo puts a ſtop to growth in all vegetables. *Obſervation.*

If Roots, or Peaſe, &c. *may be accelerated in their coming, a double profit may be made; in ſome ſtrong grounds you ſhall have Radiſh*, &c. *in a Month.* Experiment. 409.

Peaſe, Radiſh, &c. are haſtened in the Spring and Sommer, and their returns quick, chiefly becauſe they are ſowed, and ſet in a warm place, upon ground ſloping upon the *South-Eaſt* Sun; with ſome ſpecial ſhelters from the *North*, and *cold Winds*. *Obſervation.*

For Nouriſhment, water is almoſt all in all, therefore it is a comfortable Experiment for good drinkers. Experiment. 411.

Observation. *Simply water* affords but a feeble and weak nourishment, crude and cold; and therefore we see, that in low watrish grounds, fruit-trees come on poorly, being full of Moss by reason of the cold nourishment: and that in *dryer, deep, fat soyls*, *Fruit-trees* are three or four times bigger, and consequently longer liv'd then those in watrish grounds: Neither is this a comfortable experiment for *good drinkers*, but the quite contrary; for Experience shews us, such as live most upon good Liquors (eating but little) are more *unsound, unhealthy people*, and *short liv'd*, then those who drink less, and feed upon solid meats.

Experiment. 412. *Housing of Plants will accelerate Germination.*

Observation. Certainly it will, if the Plants be ordered with discretion, to be seasonably set out in the Sunne and Rain in the warmest seasons, and time of the day, (removing the Box of earth in and out, as occasion is) or otherwise *Housing* may spoil them, and cause the branches and twigs to contract, and become dry; for as the Aire within doores, is warmer then that without, so also it is drier, and does exhaust and dry the Plants more, therefore they have need sometimes, of the moist Aire without.

Experi-

Experiments touching the putting back, or Retardation of Germination.

TO *make Roſes come late.* First, *cut them after bearing.* Experiment. 413.

This may be a means as to ſome *Roſe-trees*, that is, ſuch as are old: I have *known* ſome of long ſtanding, perhaps a dozen, ſixteen, or twenty years of age, and ſome of ſeven or eight years, (cut newly after bearing) have born Roſes again a ſecond time, late in the year, being cut the next full *Moon* after they have done bearing; but there is a kind I have (amongſt many other kinds) which naturally bears a ſecond time, although the tree be but ſmall and young; beſides the Roſe called the *Monthly Roſe.* Obſervation.

Secondly, *Pulling off the buds of the Roſes that firſt ſpring forth.* Experiment. 414.

I have tried this ſecond way, which ſucceeded not, it may be, becauſe the Trees were young; but one affirmed, he pluckt off ſome buds in the *ſpring*, and the Tree bore Roſes in *November.* Obſervation.

Thirdly, *Cutting top Boughs in the Spring.* Experiment. 415.

This hath been tried alſo, but was ineffectual; but the Tryal was upon young Obſervation.

Trees: as for the Report that followes in this *Experiment of Sions perishing if the old top boughs be cut off*, it is otherwise, for it is a common Experiment to cut off all the boughs of a Tree, and to graft them, and the grafts will not onely not perish, but grow the better therefore, as having all the Sap to themselves, which naturally riseth (the Sun also drawing it up) without the help of any top bough left, as continual Experience shews.

Experiment. 416. Fourthly, *Laying the Roots bare about the end of* December.

Observation. Many hundreds of Trees are thus *bared*, yet I find no difference at all in the late *budding* or *bearing* of such *trees* from *others*.

Experiment. 417. Fifthly, *Removing the Tree some Months before it buddeth.*

Observation. It is true indeed, removing of Trees (especially so late in the year) must needs retard Germination, if they bud at all, commonly such faile, or grow very poorly.

Experiment. 418. Sixthly, *Grafting Roses in* May.

Observation. I know one that tried this Experiment: Inoculating (not Grafting) Buds in the Spring, which budded for Roses at the same time that others (of the same kind) did; which buds being cut off they bare Roses afterwards, the same year, when

when others of the same kind were gone.

Seventhly, *Girding the body of the Tree with some Packthread.* Experiment. 419.

This will not do it neither; we see commonly, that Grafts tied strait, with long flags, and some branches of *Wall-trees* nailed straight to the Wall, so that I have seen the bark *dinted* in with the straitness of the Leather and bands, yet for all that, Sap riseth plentifully through the place (so girded) up into the branch, and buds are as forward on that branch, as on any other. Observation.

Eightly, *Planting them in the shade.* Experiment. 420.

I have known *Rose-trees in a shady place*, which have not bore at all; it's a tree that loves the Sun. So this Experiment will not hold, I have tried it, and it succeeds not. Observation.

Experiments touching the Melioration of Fruits, Trees, and Plants.

AN heap of *Flint*, or *Stone*, *laid about the bottome of a Tree, upon the first Planting, makes it prosper much.* Experiment. 421.

Stones laid to the *Roots of Fruit-trees*, when newly set, is a good Experiment Observation.

in some grounds, but not in all: it's true, stones so laid, keep the Root of the Tree somewhat more moist, and warm, and stedy, that winds shake it not; and so are profitable, but there is danger (in some grounds) lest they harbor *Ants*, or *Pismires*, about the Tree Root, under the stones, which I have seen, to the hurt and destruction of divers young Trees. But it is a safer and better way to lay a good quantity of *rotten dung*, or *litter straw*, &c. round about the Roots of new set Trees upon the top of the mould, this keeps them warm in Winter, and cool and moist in Sommer, and stedy, and the moisture, and fatness of the muck, sokes down to the Roots, and refreshes the Tree very much; or for want thereof, lay a heap of weeds round about the new set *Tree Roots*, and so all the next Sommer after; these things are special advantages to new set Trees.

Experiment. 423. *A Tree at first setting should not be shaken, but after a years rooting then shaking is good.*

Observation. When young *Trees* are first planted, it's very convenient to set a stake to each of them, and tie them together with a hay band, or some soft band, that winds shake them not; and this not for a year onely, but divers years, until the young Tree be well

...roots in the earth, and also be grown ...ng, that the winds bow not their bo... ..., and cause them to grow crooked, ...ich faults I have seen in very many ...

Cutting away suckers, and side boughes, Trees grow high. Experiment. 424.

All *suckers* must be cut away from the ... of *Trees*; and as for *side branches*, ... may be cut as men are minded to ... their Trees to spread, nearer, or ...gher from the ground: but cut not the ... branches too soon, before the body be ... strong enough to bear the head, ... it will be top heavy, and grow crook- Observation.

To have many new Roots of Fruit-trees, by the branches in the ground, &c. Experiment. 426.

The branches of all kinds of Trees will not take Root thus; This way of Propagation is only for some kinds, as *Mulberries, Figs, Vines, Quodlings, Nurs-gardens*, and some lothen kinds of Trees, whose branches are soft and porous. As for *Apricots, Peaches*, and such like, they will not take Root thus: I have tried, but not one Root could be got, neither will they take with *grafting*, I have tried many. The way to propagate these kinds, is by *Inoculating* buds upon young stocks full of sap. Observation.

From

Experiment. 427. *From* May *to* July, *you may take off the bark of any bough, &c. and set it, and it will grow to be a fair Tree in one year, the cause may be for that the baring from the bark keepeth the Sap from descending towards Winter.*

Observation. It is true, that the Boughs of *some kinds of Trees* will take Root in this manner as is here expreſt; that is, ſuch kinds as will take root with laying down in the ground mentioned in the laſt experiment; which being cut off and ſet, may grow to be a fair Tree in certain years, not in one year (as is ſaid) for the Roots (got in this manner) are but ſmall, and very *diſproportionable* to the bough, ſo that it can come on but very poorly, and ſlowly, for divers years: As for *the baring from the bark*, which is ſuppoſed to keep Sap from *deſcending towards Winter*; I ſay, the Sap is as far from *deſcending* when the bark is on, as when 'tis off; there's no ſuch thing in nature as deſcention of Sap in any Tree whatſoever.

This worthy Author took this upon truſt, according to the general opinion of men, for had he but ſtayed a little to conſider it, he would have found it groundleſs, and a meer conceit; For all the Sap that aſcends into the body and branches of

...ee, is changed into *wood*, *bark*, *buds*, ...*ves*, *leaves* and *fruits*, it is turned into ...at body and substance which we see ... ground, and none at all descends at ...time; for there is no *Cause*, and there ... no such *effect*: sap is continually ascending all the year long, more or less, ...er for the growth of the Tree in *Summer* for the *conservation* of it in life, and ... its dimensions in *Winter*; for there is ...ntinual *extraction of Sap* out of the boughs, and branches, by the *Sun* and ..., as this Author elsewhere asserts and ...ch Experience proves. Now, if there ... at any time a *descention* also, what ... would become of the Tree, it would ...ckly wither, be contracted, and shrink ...arently: whosoever is unsatisfied with ...t is here said against *descention of Sap* ...*Trees*, may see (hereof) more largly ...ny Arguments against it in my *Treatise* ...*Fruit-trees*, pag. 191, 192, &c.

If Trees bear not, bore a hole through the Experi-
...*rs of the Tree, and it will bear.* ment. 42.

Perhaps this course may do some good Observa-
... letting out some superfluous sap, if too tion.
...ch repletion be the cause: But there ... divers other causes of barrenness of

Fruit-

Fruit-trees: As too deep setting, the roots running down into *Gravel*, *Clay*, *Water* &c. which must have answerable remedies. And sometimes it is in the nature of the Trees: that all the culture in the world used to the Roots and body, will not help, without engrafting the branches with Grafts of some good bearing kind, which is the best way I know to have store of good fruits, (and speedily too) from barren Trees.

Experiment. 429. *To make Trees bear, cleave the chief roots, and put in a small pebble.*

Observation. This may be profitable, not onely for that the *Root* may be *bark-bound* as well as the body and branches, (which must be scored down, and cut to the wood) but also it will cause the Roots to shoot forth many small Roots at the place opened, which will afford more vigour, life, and sap to the branches, and so make the Tree stronger and more in heart, and able to bring forth more, and fairer fruits.

Experiment. 430. *Trees against a South-wall have more of the heat of the Sunne, then when they grow round.*

Observation. *Apricots*, *Peaches*, and such like cold fruits, will scarce ripen but against a *South-wall*: they have need both of the direct, and reflex beams of the Sun: And if it

were

more practised to set some other kinds of fruits upon a *South-wall*, as great *Burgamet*, *Sommer Boncriten*, *Green-field Pear*, and other special kinds) would advantage them greatly, not only in bignesse, but also in their early ripening and goodnesse of taste; thus, one or a few, would be worth many ordinary ones.

Some pull off the leaves from Wall-trees, that the Sunne may come the better upon the buds and fruit. Experiment. 431.

This may hasten ripening, but it hinders the bignesse of the Fruits, the Sun ripening them before they have attained their natural greatnesse: in case it prove then very weather, so that if leaves be pulled off, it should not be till fruits are at bigest, and then, but where they overmuch shade the fruits; some convenient shade by the leaves is as necessary for the Fruits, (in order to bignesse and goodnesse) as the Sun. Observation.

The lowenesse of the bough, maketh the fruit greater, and to ripen better, &c. Graft a tree low, and maintain only the lower boughs. Experiment. 432.

Low Trees, and the *lower boughs of high Trees*, have their fruit ripe somewhat sooner then the *higher*, because they have some benefit by the reflection of the Sun from the earth, as well as from the wall; (if they grow Observation.

grow against a wall) but that the *fruits are greater* on *lower*, then on *higher boughs*, I perceive not; I am sure I have seen sometimes fair fruit on the *higher boughs*, and but small on the *lower*, in case the *branches* of a *wall tree* have been permitted to grow streight upwards, without bowing down along the wall, as most commonly they be, and the reason is plain, because the most, and greatest quantity of Sap presseth upwards, & leaveth the *side branches indigent* of Sap, whereby they grow poorly, and some die for want of Sap: now according to the quantity of Sap in branches, so are the fruits smaller or greater. It is true indeed, many *little* and *low Trees*, if they be vigorous, and shoot well, bear very large fruits, it may be, larger then high Trees of the same kinds: but this is not because low, but because they are more lively and vigorous then the other. And if we should graft a Tree low, and maintain only the *lower branches*, by continually cutting off the *higher*; this would much enfeeble the Tree by degrees, by obstructing of the Sap, and the fruit would be accordingly. But the best way to order a *Wall tree* that shoots upwards strongly, is to bow those strong branches along the wall both ways, and then there will be as

large

large fruits on the *lower*, as on the *higher* boughs, and *sooner ripe*.

Experiment. 433.

To have Fruit in greater plenty, the way is to graft not onely upon young stocks, but upon divers boughs of an old Tree, &c.

Observation.

It is an excellent Experimente to graft the boughs of an old *Tree*, (that is a bad *bearer*, or bears bad *fruits*) with Grafts of some *special good bearing kinds*, for this will have large branches, and bear fruits, even in a year or two; so that it is a very unwise course of many who (when some of their Trees bear not as they would have them) cut them down, and set young ones in their Room, which cannot possibly attain the bigness of the former in many years.

Experiment. 434.

Digging yearly about the Roots of Trees, is a great means, both to the acceleration and melioration of fruits, &c.

Observation.

Old Trees, that grow in *stiff, cold, clay grounds*, have most need to be dug about *yearly*, that thereby the ground may be more open and mellow; but for young Trees of few years standing, (especiall if in *sandy, mellow grounds*) these have little or no need at all of digging about: To dig about *Roses*, and such like, which grow near the top of the ground, I conceive it is needless, for this work is chiefly to open

the earth about old *Fruit-trees*, (whose Roots are grown great and deep) that the *Rain*, *Snow*, and *Sun* in *Winter*, may reach the *bottome Roots*.

Experiment. 435. *A Fruit-tree almost blown up by the roots, and set up again, the next year bore exceedingly: loosening the earth, comforteth any Tree.*

Observation. Trees blown down, and raised up again, and well moulded, may root again if they be not very old; and though *digging about the Roots*, *sometimes* be good, yet overmuch *digging*, *and loosening the earth about the Roots of Trees*, will cause many to be blown down by great winds, which will not fasten again to abide a strong Wind in many years, if ever.

Experiment. 436. *To revive an old Tree, the digging of it about the Roots, and applying new mould to the Roots, is the way, and change of mould to the better is profitable.*

Observation. Digging, (as hath been said) with caution, is very good; and change of *mould*, if to the better, is also very advantagious to Fruit-trees, in case the soyl be barren, but if it be very fat, as some is, (especially some particular places by accident) then mould that is more *steril* and *hungry*, will do better; for *overmuch repletion* and *fertility*, *may hinder fruitfulness*, and cause the

sap

sap to run most into *long shoots, and broad leaves.*

The shifting of ground, is a means to better the Tree and Fruit: and all things do prosper best, when they are advanced to the better. And a Nursery ought to be in a more barren ground then the places whither they are Transplanted. Experiment. 439.

It is true, *change of soyls* sometimes is very good, if to the better: but is true also, that if Trees grow in *over rank soyle*, then *worse*, will be *better*: that is, will help more towards *fruitfulness*; as a *course* and *mean fare* is better for a *fat* man, then the more delicious. Without controversie, *young Trees out of barren Nurseries*, come on faster when *Transplanted*, then out of *fat soyls*; but in case the *Nursery* be *fat soyle*, then some other as good must be laid to their Roots when set again. Observation.

Hacking of Trees, doth great good to Trees. Experiment. 440.

After eight or ten years growth, *cutting*, or *scoring*, or *hacking the bark of Trees with a knife*, is profitable; but while they are young, the Barke is but thin and tender, and enlargeth well enough without this *cutting*, unless some that through barrenness of soyl (or other cause) are *bark-bound*, and to such, *hacking* and *scoring* is profitable. Observation.

Experiment. 441. *Shade to some Plants, conduceth to make them large and prosperous, more then Sun, as in Strawberries and Bays, &c.*

Observation. It is true, *Bays* and *Laurel* prospereth better in the *Shade* then in the *Sun*, being hot Plants, but *Strawberries* do better partly in the *Shade*, and partly in the *Sun*, then in *Shade only*; as among *Bushes* and other *Plants*: I have observed those in the *Shade*, to bear little or nothing, when others of the same kind and growth, somewhat in the Sun, bore very much.

Experiment. 447. *Pulling off many blossomes from a Fruit-tree, doth make the Fruit fairer; and if some blossoms be not pulled off the first time a Tree bloometh, it will blossome it self to death.*

Observation. Commonly the fewer blossoms upon a tree the fairer will the fruit be, because (as the *Author* says) of the plenty of sap: And indeed, in case a Tree *newly planted*, blossome very much, and the Root be but weak, (which may be perceived by the weakness of the buds) then its best to pull off most, if not all the *blossoms*: but many I have known (the first years planting) take Root so strongly (being in good *mould*) as that they *blossome* and *shoot forth*, and bear *fair fruits* the same year.

Experiment. 450. *It were good to try what would be the effect if all the blossomes were pulled from a Fruit-tree, for two years together.*

Fruit-

Fruit-trees that bear but every other year, they (for the most part) bear that year very plentifully; and the excessive expence of Sap that year (its like) makes the Tree the more feeble the next; but if *blossomes be pulled off a year or tw together*, I suppose the Sap would go more into the *shoots*, and make them larger then if it bore fruits; and the issue as to bearing *more or better fruits*, would be *nothing worth*. *Observation.*

There is no doubt but that Grafting (for the most part) doth meliorate fruit; the cause is manifest, for that the nourishment is better prepared in the stock, then in the crude earth. Experiment. 452.

Grafting doth not at all meliorate the fruit simply in its self; for a Tree will not be the better for *grafting*, unless the *grafts* be taken from a good Tree. If the Tree from which grafts are cut, be no better then the Tree which is grafted, then grafting will not a jot mend the fruit; which it would, if *grafting* were any thing towards the *bettering of the fruit*. The *cause* why *grafted Trees* bear *better fruits*, then *wild ungrafted trees*, is not because they are *grafted*, but because the *grafts are good*, the tree from which the *grafts* are cut, is of a *good kind and nature*, and every *twig*, *graft* and *bud*, hath the *nature* of the *Tree* in it per- *Observation.*

perfectly; the properties of the Tree are in all, and every part, as the Soul in the body, which *tota in toto, & tota in qualibet parte*; and the grafts retain the nature and properties being grafted upon wild stocks, and bring forth fruits accordingly: and that's the *cause that grafting doth meliorate the fruit*, and not because *the nourishment is better prepared in the stock, then in the crude earth*, for the branches of an ingrafted Tree, do no more receive nourishment from the crude earth, then the branches of a grafted Tree: but the sap and nourishment, passeth up a body or stock to the branches, in the one, as well as in the other.

And as it is true, that the *Peach and Melacotone* (as the *Author* says) do bear good fruits coming up of stones, (which is not always so neither, onely here and there one) so it is true also that they bear as good fruits of the *bud* being *Inoculated*.

Experiment. 453. *It hath been received, that a smaller Pear grafted upon a stock that beareth a greater Pear, will become great, &c.*

Observation. It is true (as the *Author* thinks) that this will not succeed, because the *Grafts* do *govern*, they always bring forth fruit answerable to their own natures and kinds, else it were to little purpose to get grafts from

from such, or such a good Tree, to have more of the kind. Yet it is true also, that the stock hath some influence upon the graft, so as to make the fruit *better* or *worse*, according to the nature of the stock, in some *small degree*: As if we graft upon a stock that naturally bears a *sower, harsh* fruit; the fruit of the graft will not be altogether so pleasant as if it were grafted upon a stock that bears naturally a *sweet and pleasant fruit*: and hence it is that *Pears* grafted upon *Quince-stocks*, will be more delicate then upon *Pear-stocks*: The *Quince-stock* gives an excellent taste to it, but these Trees upon *Quinces*, will never attain to any great bigness, for all *Quince*-trees are but small in comparison of *Pear*-trees, and where the stock can be but *small*, the graft cannot be *great*: yet (as I have seen it) somewhat bigger then the stock; As for a *Pear* upon a *Thorne*, (which this *Author* speaks of) it cannot be good, it makes it a harsh, hard *Pear* at the core, if it thrive and bear, but most commonly they die in two or three years: we know its natural fruit (*Hawes*) have stones in them: But for the *Apple* upon the *Crab*, that's natural, the *Crab* being a *wild apple*, and very proper to graft all sorts of *Apples* upon, in regard of the soundness of the

ſtock, its *long lasting*, and *aptneſs to take with grafts*, and alſo to grow when ſet in the ground; although it's true, it makes the fruit ſomewhat more *tart*, then the ſame fruit upon *ſweet Apple ſtocks*.

It is true, that the ſeeds of ſome *Apples* and *Pears*, brings forth very good fruit; the cauſe of this (I ſuppoſe) is, for that the ſtocks whereon theſe fruits were *grafted* or *Inoculated*, were *good* kinds of themſelves, kinds that came good of ſeed formerly; and if ſo, no marvel though the ſeeds bring forth good fruits without *Grafting* or *Inoculating*: and upon the Experience, *Peach-ſtones* have brought forth a paltry naughty fruit many of them, though ſome good: As concerning the *Grafting of an Apple Cion upon a Sallow, Poplar, Alder, Elme, or Horſe-plum*; it is in vain to try, for tryal hath been made upon ſtocks nearer in kind then theſe, and it would not come to perfection; they will grow a year or two, (it may be) and then decay and die.

Experiment. 452. *Flowers removed, wax greater, becauſe the nouriſhment is more eaſily come by in the looſe earth: It may be that often regrafting of the ſame Cions, may likewiſe make fruit greater.*

Obſervation. To *remove Flowers* (ſmall young Roots) into good freſh earth, will improve them

in

growth and bigness; especially if [illegible]al some of the *side-slips*, (and also of [illegible] buds which the Root shoots up for [illegible]wers) be cut off, and some half a dozen, [illegible] half a score of the *buds* or *shoots*, be left [illegible]grow upon the Roots; the Root then [illegible] be able to give plentiful nourishment [illegible] them, whereby they will become *much* [illegible]*ger*, then if all the spindle buds were [illegible]fered to grow.

But as for *often regrafting the same graft* [illegible] order to make a large *fruit*, this will not [illegible] it, for we see it is constantly done [illegible] year to year; for what else is the [illegible]tting of Grafts from young Trees, (it may be of two or three, or but of one years growth) and grafting them again upon stocks, and repeating this for many years together, and yet we know the grafts hold their own natural properties from one year to another. And though there be (as hath been said) some small alteration according to the kind of the stock, *while it grows upon it*, yet that alteration is lost, and falls off, when the Graft is engrafted upon another stock, and the Graft retains its own natural properties only: with some small addition of the nature of the stock on which it (at present) grows.

cut off.

Observation. If the *Fig-tree* be very old, *cutting of the top* may be profitable; for that such cutting (as in all other Trees) maketh the Sap shoot forth into branches more *vigorously* then otherwise it would; by which lively rising of Sap, the whole Tree, and the Fruit upon it, fares the better: but if the *tops of young Trees be cut off*, (*Fig-tree* or other) there will shoot forth (in the room thereof) such *large strong shoots*, that the main stream of Sap will run that way, which great shoots will be for a year or two (it may be) *unfruitful*.

Experiment. 456. *It is reported, that Mulberries will be fairer, and the Trees more fruitful, if you bore the Trunk of the Tree thorow in several places, and put in wedges of hot Trees, as Mastick, Juniper, &c.*

Observation. As for the *black Mulberry-tree*, it needs not these things to make it fruitful, for I never knew any of them fail of store of fruits every year; but *white Mulberry-trees* (with us) have need enough of all helps that may be.

Experiment. 457. *It is reported that Trees will grow greater, and bear better fruit, if you put Salt or Lees of Wine, or Blood, to the Root.*

Con-

…is certain there are helpful to
…trees, both as to their growth and
…ge, if seasonably and moderately ap-
…pecially to old Trees. I account it
…o be applied to the Roots of Trees
…beginning of Winter, that the virtue
…sink into the Roots and earth about
…before the Spring.

…ebration of trees, as it makes them pro- Experi-
…better, so also it is found, that it makes ment. 463.
…sweeter and better, by causing the sour-
…es to sweat out, and the rest is better

…ebration (or boring holes in the bo- Observa-
…and great Roots) of Fruit trees with a tion.
…ble or Awger, is most needful, as I
…for great Trees which grow upon
…and, and have too rank nourishment,
…may be unfruitful, and bear over wa-
…fruit for that cause; that may help to
…out some of the raw, superfluous sap
…juice, as an issue in a mans body: but
…of cutting the Bark of young Trees
…Twenty years may be better for
…, and this to be done chiefly in the
…time.

…Terebration doth meliorate Fruit, so Experi-
…letting of Plums blood, as pricking ment. 464.

Vines

Vines or other Trees, after they be of
growth. It is reported, that by this
bitter Almonds have been turned into

Observation. This must needs have the like
(in some proportion) as those parti
before mentioned of *boring with Wi*
(or the like) *and scoring the bark*, wi
knife in the spring time.

Experiment. 426. *The Antients for Dulcorating of Fr*
do commend Swines dung above all
dung, which may be for the moisture of
Beast.

Observation. I have seen divers fair Fruit-trees, q
spoyl'd and deaded by overmuch *Swi*
dung, the Swine lying amongst them,
continually leaving their Excrements,
degrees the Trees withered and di
but I doubt not but that a moderate qu
city of *Swines dung*, mixed with mo
and laid to the Roots of Trees, wil
good for them, and it may be in order
the *sweetning of the Fruit.*

Experiment. 467. *As Grafting doth generally advance,*
meliorate fruits, so (no doubt) even in g
ting, the choice of the stock doth much
commend much the grafting of Pears, or
plus upon a Quince.

Observation. *Grafting*, (simply as grafting) doth
advance or meliorate fruits, as is shew
elsewhere at large; But *grafted trees* be
bett

...ruits, and *sooner*; then *ungrafted* ...because grafts are usually taken from bearing Trees, and of the best kinds, Grafts (retaining the Nature of the ...from which they are cut) do bring the same Fruits; so also do *Buds*, ...gh they be much smaller then grafts) ...*inoculated upon wild stocks*.

See pag. 18. Treatise of Fruit-trees pag. 98.

...concerning the *choice of Stocks in* ...*ing*, in order to the advancement of ...; it is certaine, the goodness of the ...in respect of *nature and kind*, is very ...derable: The *sweeter* and *better* the ...k, the better will the fruit be that is ...ted thereon: Though it be true, *grafts govern*, and bring forth the same ...t, according to their *own kinds*, yet the ...hath some considerable influence up- ...the fruit of the graft, and thence it is, ...*Pears upon a Quince* (as the Authour ...ks of) are better then the same kind ...n a *wild Pear-stock*; as *experience shews*) ...cause a *Quince* is a more excellent fruit, ...a *wild Pear*, so the nourishment of the ...is answerable.

It is set down as try'd, that a mixture of ...*n and Swines dung, or Chaff and Swines* ...*g rotten, is a great nourisher and comfor-* ...*te a Fruit-tree.*

Experiment. 468.

There is no doubt but *Swines dung*, or any

Observation.

any other dung, with other Composts
together till they be rotten, will no
and comfort Fruit-trees, and better w
they are throughly rotten, and turne
mould, then before, because *new dung*
be too hot.

Experiment. 470. *It is delivered by some, that if one tak
bow of a low Tree, newly budded, and
it gently into an earthen Pot, perforated
the bottome to let in the Plant, and then
the Pot with Earth, it will yield a very la
fruit within ground; the like will be effec
by an empty pot, with some few pertuis
made in the Pot, hang'd in the Tree.*

Observation. Concerning the first of these wayes,
suppose the Fruit growing upon the bo
so bowed down into a Pot, will not be
large as the Fruit upon the other bough
because we see by experience it is agai
the nature of Sap to run *vigorously*, (or
may great plenty) into bows bended dow
wards so near the earth, as this must need
be, for Sap presseth upwards in greate
plenty; and consequently those fruits wi
be *greatest*, which have *most sap*, I mean
such as are of one kind, upon one *Tree*.

And concerning the *second means* by the
perforated Pot, hang'd in the Tree, that is
more likely to work the effect, as to the
greatness of fruit, not so much (I suppose)
became

...se of the *pertusions* or holes in the ... as by the shade that the fruit hath by ... Pet: for although fruit that grows in ... Sun, be much *better*, and more *pleasant* ... that which grows in the shade, (as be... better concocted) yet that in the shade ... the same kind) is commonly the grea... but more *flat*, *dull*, and *inconcoct*: as ... see in *Aprecots*, *Cherries*, &c. under the ...ves.

All Trees in high and sandy grounds, are ... set deep, and in watry grounds more shal...: And all Trees when they be removed (especially Fruit-trees) care ought to be ta... that the sides of the Trees be coasted (North and South) as they stood before. Experiment. 471.

It is true, that Trees on higher *grounds* ... to be set somewhat deeper then in ...ist *grounds*; yet beware of setting be... the good soyle in any ground. As for ...sting of *Trees*, that is, (setting the same ... to the *South*, when Transplanted, as ... before) the *Rule is good*, but not *ne...ssary*: for many thousands are transplan... with good success, not observing which side grew *North* or *South*: howso...ver, some reasons might be shewed why ... best to observe it, if it may convenient... be done. *Observation.* See hereof Treatise of Fruit-trees

Fruit-trees, set upon a wall against the Sun Experiment. 472.

Sun, between Elbowes or Buttereſſes of ſtone, ripen more then upon a plain wall.

Obſervation. *Fruit-trees ſo ſet*, have their fruits ripe ſooner then thoſe upon a plain wall, not ſo much becauſe they are *defended better from winds*, but chiefly, becauſe they have a *double* or *treble degree* of heat to what thoſe upon a plain *Wall* have, the heat being pent in by the *Elbowes* or *Buttereſſes* of the wall, and ſo reflects the *ſtronger* upon the *Fruits* and *Trees*; there is a double reflection of heat upon ſuch.

Experiment. 475. *Grafting Elms, (or other unfruitful trees) will make their leaves larger: as in Fruit-trees the Graft maketh the greater fruit.*

Obſervation. *Grafting*, barely conſidered as *grafting*, will not do this, it will neither make *leaves* nor *fruits fairer*, but as ſtocks are choſen for the purpoſe: for though it be true (as hath been elſewhere ſaid) that *Grafts govern* and overrule the *ſtocks*, bringing forth the ſame leaves and fruits when grafted, as before, according to their own Natures; yet it is true alſo, that the ſtocks have ſome *ſmall influence* upon them, in making the fruits *better* or *worſe* in *taſte* and *bigneſs*: and ſo of the *leaves in fairneſs*, according to the *goodneſs* or *badneſs* of the *ſtocks*: yet notwithſtanding *Grafts* and *Buds* inoculated, may be ſaid to *Rule*, and bring

ring [illegible] the *same fruits*, else it were in vain to graft.

Barrenness of Trees cometh of their overgrowing with Moss, or their being Hide-bound, or planting too deep, or by issuing of the sap too much into the leaves. Experiment. 476.

There are several *causes* of the *barrenness of Trees.* I conceive *Mossiness*, as *Mossiness*, is not the cause of *barrenness*, but the *causes of Mossiness* are the *causes of barrenness*, which are *coldness*, *overmoistness*, and *barrenness of the soyle* where the Trees grow: Therefore *such soyles* must be amended. See how, *Treatise of Fruit trees*, pag. 213, 214, &c. *Observation.*

Also *barrenness* is often, by reason of the *excessive sap and moisture of Trees*, which is manifest by their strong and *vigorous shoots*, *branches*, and *broad green leaves*, as in many young full-fed Trees; for while nature is vigorous, and active, spending it self that way, in the *excessive growth of the Trees*; it is then *weak* and *feeble* in *bearing of fruits*. Now as to some *kinds of Trees*, it is not best (for some time) to go about to remove the *Cause*, that is, as to standard *Apple-trees*, *Pear-trees*, and other kinds, which grow in the Orchards and Fields: but let them alone, let them go on in their *large* and *vigorous growths* for certaine

years, though they *bear but little*, provided that we know they are naturally of good bearing kinds, otherwise it is in vain to wait for store of fruits from such *Trees*) After that such Trees have grown exceedingly some years, and attained a fair large growth, they will then by degrees, grow less in the branches, and fall to bearing of fruits: But in case the Trees are *Wall-trees*, and shoot excessively, and bear not, then it will be best to take away the *cause* as much as we can; that is,

First, abate their *overful & rank nourishment*, by putting in *Sand*, *Gravel*, *Buck-ashes*, or any thing that is *barren*, instead of the *fat soyle*.

Secondly, Also cut off, and part one or two of the *biggest Roots* from the body, that so it may have less nourishment, and that left will turn to fruits.

Thirdly, Bend downwards the *branches*, and fasten them to the wall with their tops as low as may be, this obstructs, and restrains the excessive rising of sap, which rising moderately, turns to fruits. But if the Trees are naturally *bad bearers* (if barren upon that account) then there is no remedy for such, but grafting them again, with grafts taken from some *good bearing kinds*, which are known by yearly experience to *bear fruits well*. It

It hath been set down by one of the Ancients, that two twigs of several Fruit-trees, slatted on the sides, and bound together, and set, they will come up in one stock. And that Vines of red and white Grapes, slatted and bound together, will bear Grapes of several colours upon one branch: Also the shoots of divers seeds, will incorporate: And that young Trees of several kinds, set contiguous, will incorporate. Experiment. 477, 478, 479.

Com. pounding of Fruits.

These, and such like, are prescribed in order to the *compounding of Fruits.*

Concerning *compounding, or mixing of divers kinds of fruits*, whereof to make *one new kind*, these things before mentioned, (and many such like) have been prescribed by *Antient Authors*, which are of the number of those things * Sir *Francis Bacon* accounts meet *imaginations* and *conceits*, without any ground or light from *Experience.* Observation.

* Nat. Hist. pag. 165.

He says ‖ (elsewhere) That *many things have been rashly, (and with little choice or judgment) received and registred, as appears in the writings of divers Authors, which are every where fraught and forged with fabulous reports, and those not only uncertain and untried, but notoriously untrue, to the great derogation of Natural Philosophy with grave and sober men.*

‖ Advanc. Lear. l. 1. pag. 32.

As for those things before mentioned, they can never effect what is promised, to produce *compound fruits*. For we see by continual experience, that *grafts* and *buds*, (though never so small) set upon stocks of different kinds, do hold their own, and keep their kinds; and so it would be if *two long shoots* were united, or *three*, or *many*. If it were possible to make them incorporate, and become one body, yet they would retain every one their own nature, and bring forth each its own kind of fruit, without commixture.

If any man desire to be set on work about these things, he may have prescriptions enough out of a certain Book, Entituled, *The Country Farme*, pag. 360, 361, 362, 363, 364, 365, &c. For more full satisfaction about which, and all of that nature, see my *Treatise of Fruit-trees*, p. 174, 176, &c. where these things are spoken to largly.

But if the thing be possible in nature, to *mix and compound fruits*, the likelier way that I apprehend is this, (which I have upon tryal, but is not yet come to an issue) viz. To graft one fruit upon another many times over, every year a different kind, (so that we keep still to those kinds that will grow together.) As first to graft a

Crab-

Crab-tree near the ground, with ſome good kind of *Apple graft*, and the next year to graft that again a handful or two above where the firſt was grafted, and the next year to graſe that ſecond graft, and the fourth year to graft that third graft, a *handful* or *two* above where it was *grafted*, and thus every *year* to ſet *graft upon graft* for divers years together; this (probably) may make ſome alteration and commixture in the *top branch* and its fruit, although it be true, that every graft keeps its own nature, yet ſo as that it receives *ſome ſmall alteration* from the *ſtock* (as hath been ſaid) Now the Sap ariſing, and paſſing through ſo many kinds of ſtocks (as before) up into the top branches, this (if any thing) I conceive will have an influence into the fruit of the laſt graft, to cauſe ſome commixture (more or leſs) in the fruit; the ſap paſſing through *ſo many kinds of ſtocks*.

Thus, as of many kinds of *Apples* together, ſo alſo of *Pears* among themſelves, and of *Cherries* and *Plums* among themſelves, but as for mixing contrary kinds, *Apples*, *Pears*, *Cherries*, *Plums*, &c. all together, as ſome preſcribe, there is no hope nor poſſibility of any advantage thereby.

Experiment. 480, 81, &c. Sympathy and Antipathy of Plants.

All Plants that draw much nouriſhment from the earth, and exhauſt it, hurt all things that grow by them, as Aſh-trees, Colewbrts, &c. And where Plants of ſeveral natures (which draw ſeveral juices) are ſet together, there the nearneſs doth good; As Rue by a Fig-tree, Garlick by a Roſe-tree, &c.

Obſervation.

It is true indeed, That all *Trees* and *Plants*, that draw much nouriſhment from the Earth, are no good Neighbours to any thing that grows near them, becauſe ſuch make the Earth *barren*, in which Plants muſt needs grow *poorly*: But that *ſeveral kinds of Plants*, draw *ſeveral kinds of juices*, out of *one and the ſame ſoyl*, I much queſtion: as that bitter Plants, (*Rue*, *Wormwood*, and the like) draw the bitter *juice* of the earth, and the ſweeter kinds, as *Roſes*, *Flowers*, &c. draw the ſweeter juice. For can it be imagined that there are ſo many kinds of juices in the Earth, as there are ſeveral kinds of *Trees* and *Plants*; ſo that every one ſhould draw only its *proper* and *peculiar nouriſhment*? May it not upon better grounds be ſaid, that many Trees and Plants, growing near together in a piece of ground, though they draw all of them *one and the ſame juice*, yet they convert and aſſimilate the ſame, every one into its *own ſpecifique nature*. We ſee that

in

to a little *Garden*, where there are (it may be) divers hundreds (or thouſands) of *diſtinct Plants*, *Trees*, *Flowers*, *Herbs*, and *Simples*, they *growing* all upon one and the ſame ſoyle, do convert the juice and fatneſs of it into their ſeveral natures: by the ſame *Law in Nature*, as ſeveral kinds of *Grafts* upon one *Tree*, drawing *one and the ſame Sap*, do turn that *one kind of nouriſhment* into their *ſeveral natures*, whereby they bring forth (as we ſee by *experience*) diſtinct, and ſeveral kinds of fruits, made of the ſame ſingle juice, or ſap of the *Tree*, whereon they all grow: this they would do, if there were all or many kinds of *Apples*, grafted upon one great *Crab-tree*, and ſo of *Pear-trees*, *Cherry-trees*, and the like, upon their own kinds: though multitudes of diſtinct kinds of grafts, draw *one and the ſame ſap*, yet every one changes it into its own nature; and why ſhould it not be ſo alſo with ſeveral Plants, drawing *one and the ſame juice out of the earth?*

So that I *cannot conceive* that thoſe *things* mentioned, (or the like) if try'd, would ſucceed to the purpoſe: *viz.* That *Rue* ſet by a *Fig-tree*, will make *Figs taſte ſweeter*; or *Garlick* ſet by *Roſe-trees*, will make the *Roſes ſmell ſweeter*; or *Sorrel* ſet by *Raſps*, will make the *Raſps ſweeter*, and the

likes: becauſe ſeveral, or contrary kinds of Plants, meet not with ſeveral kinds of juices in the ſame ſoyle, (ſhall we think there are hundreds, or thouſands of ſeveral juices in one Garden) though they draw the ſame juice, they convert it, and aſſimilate it into their ſeveral natures, according to the *Innate* and *Intrinſecal* form that every one hath, as was ſaid before of ſeveral kinds of *grafts* upon one Tree.

Experiment. 499. Making Herbs and Fruits Medicinable.

The altering of the Scent, Colour, or Taſte of Fruit, by infuſing, mixing, or letting into the Bark or Roots of the Tree, Herb, or Flower, any Coloured, Aromatical, or Medicinal ſubſtance; are but Fancies: All alteration of Vegetables in thoſe qualities, muſt be by ſomewhat that is apt to go into the nouriſhment of the Plant.

Obſervation.

Divers *Authors* (in their *Books of Planting Fruit-trees*) have given ſeveral directions for the altering of the *Scent, Colour*, and *Taſte* of *Fruits*; but none of them from any well grounded Experience. Many particulars are mentioned, and ſet down at large, (with *Reaſons* and *Experience* againſt them; that men may not be deceived by them, and looſe their time, coſt, and labour, about ſuch *fancies*) See pag. 176, 177, &c. of the *Treatiſe of Fruit-trees*.

But

But as this *Author* says well, The likeliest way to make *herbs* and *fruits Medicinal*, and to give them a *good relish*, is the *often watering* of the *Tree* or *Plant* with that *substance*, which we desire they *should* partake of; for this is certain, (and we see it by manifest experience) that *Plants*, and *fruits of Trees*, do some what *taste*, and *partake* of the nature and virtues of that kind of nourishment which they *continually draw*. As if *Trees* grow upon a *low*, *moist*, *watrish ground*, the fruits will be *more spongy* and *waterish*, then the same kinds of fruits, where the *Trees* grow upon a *dry*, *sandy soyle*: So if *Cabbages*, *Turneps*, *Carrots*, and such like, grow in a *rank Soyle*, full of *filth* and *dung*, they have a virtue and relish accordingly, not half so sweet and pleasant, as the same kinds growing upon *pure mould*, or *sweet sandy soyle*: so here, if men think it worth the while, if they judge it will answer their *labour*, *cost*, and *time*, to water *fruit-trees*, *herbs*, *plants* and *flowers*, with *Aromatical*, and *Medicinal substances*: Infusions of *Cinamon*, *Ginger*, *Cloves*, *Mace*, and such like spices, to give a *pleasant relish*, or (for *Physical* respects) with *Hellebore*, *Opium*, *Scammony*, &c. If they can afford to give them enough from time to time of these things.

(watring

(watring their Roots abundantly therewith) then its probable such *Plants*, will somewhat partake of their *virtues*: but as for *slitting of their Roots*, or *perforating the body of the Tree*, and *infusing the medicine*, or *steeping the seed or kernel in some Liquor wherein the Medicine is infused*; these I account as good as nothing, not only for that the virtues cannot be communicated, or transfused by this means, but also because, though they were carried to all the parts of Trees and Plants, yet such *small quantities* would be *indiscernable*, the effect would be as *nothing at all*.

The VI. CENTURY.

Experiment. 401, &c. Curiosities about fruits and plants.

IT *is a Curiosity to have several fruits upon one Tree, some early, and some late, ripe fruits all Sommer. This is done by Grafting several fruits upon one Tree: But I conceive the diversity of fruits must be such as will graft upon the same stock, not contrary kinds.*

Observation.

It is true, (as the *Author* says) that several fruits may be *grafted* or *Inoculated* upon one *Tree*, some *early*, and some *late*; but yet (as he also observes) they must be of such as will take, and grow together, as many

many kinds of *Apples* upon one Tree; ſo of *Pears*, and of *Cherries* among themſelves, and the like: And it is not true which ſome *Authors* have written, that *Cherries*, and *Plums*, *Figs*, *Nuts*, *Peaches*, and ſuch like, will grow together upon *one Tree*.

Yet a Book, Intituled the *Country farm* (compoſed by ſome *Doctors of Phyſick*, and other inexperienced men) is full of ſuch odde conceits, pag. 360, 361, *&c.*

It is a Curioſity to have fruits of divers ſhapes and figures; This is eaſily performed by moulding them when the fruit is young, with moulds of earth or wood, of ſeveral ſhapes in the innerſide, as it is in mould works of Liquid things: let the moulds be made partible in the middle, that they may be opened. Experiment. 502.

Alſo Trees or fruits, may be with inſcriptions and engravings upon them, by writing with a Needle, or Bodkin, or Knife, when the Trees and fruits are young; and as they grow greater, ſo the letters or figures will be more plaine. Experiment. 503.

If men be not content with the *natural form of fruits*, they may (if they have ſo much leiſure to ſpare) put them into moulds, as is ſaid, to make them of an *Artificial form*: As for *inſcriptions*, *figures*, and *Obſervation.*

and *shapes* upon *fruit-trees*; that is, (as the Author says) performed by *scoring through the Bark* with the point of a *knife*, in the *Spring* or *Summer*, what *letters*, or *words*, or *figures*, a man pleaseth; which as the Tree grows, will become more plain and discernable, and that for many years after: I use to make a *Letter*, or *two*, or *three*, or *more*, upon all young Trees that I graft, whereby to know the several kinds of fruits; and sometimes (if the stock be grafted high) I engrave the Name of the fruit at length, which is a satisfaction to others also, when removed and sent abroad: or if any be stolen and found again, they may thereby be known; And I have perceived the Letters plainly, nine or ten years after, or more.

But as for the prescriptions of some *Authours*, about these things, they are vain and ridiculous: who direct to write upon the *kernels of seeds*, that we sow and set, and upon the Buds that we *Inoculate*, what *letters* or *shape* we please, and the fruits coming thereof, will have the same upon them; See hereof *Treatise of fruit-trees*, pag. 185.

Experiment. 504. *You may have Trees apparelled with flowers or herbs, by boring holes in the bodies of them, and putting into them good mould, and*

setting

ing slips, or sowing seeds therein, those roots of a more Ligneous nature, will perhaps incorporate with the *Tree* it self.

This is a *Curiosity* indeed, which may be done, (as the *Authour* sayes) by making holes *in Trees*, and *putting in good mould*; care must be taken to make them *slopeways downwards*; that so both *mould* and *moisture* may keep in them, about the *roots* of things that are set. But yet I should be loath to spoil a good *Tree* thus, for it must needs make it rot and perish in a certaine time: howsoever, for one or two of indifferent kinds, it may rather be admitted for satisfaction in this *Curiosity*. *Observation.*

Beauty in flowers, is their prehemineuce: It is observed, that Gilly flowers, Violets, &c. that are coloured, if they be neglected, and not watered, nor new moulded, nor transplanted, will turn white: And it's probable that the white, with much culture, may turn coloured. Experiment. 506.

I doubt not but that the *flowers* aforementioned, and divers other kinds, will not only loose the *beauty of their colours*, if they be not sometimes removed into new and better *mould*, but also, that they will in time, change from *double to single*; or else be much *smaller*, then they will be in *fresh, strong mould*. Therefore, every o- *Observation.*

ther

ther year at least, let the *mould* be changed more or less: lay about all their *Roots*, some *good*, *fresh*, *black mould*: And that we may have every year *new*, *young Roots*, and that the best kinds may be increased, the slips must be laid in *Sommer*, as I shall here shew how, though it be a common thing, and well known amongst many, yet for the sake of those that know it not, and desire it, I shall briefly speak of it.

About the beginning of *July*, (and for six or seven weaks afterwards) *slips* may be laid thus. Observe the *fairest* and *biggest slips* upon the Roots, and with a sharpe Knife, cut half way through the slip on the outside, near to the bottome, just from a joynt, and cut the slip upwards through the middle of it, about half an inch, (or little more) in length; then with a small hook stick fasten the cut part down into the mould, yet so as that the slip be not broken, or parted from the Root wherein it grows: so do to the rest of the slips upon the same Root, or to as many as you please: having so done, then mould them all up with fresh mould, that is, cover all the cut parts on every side with mould, then water them, and press the mould close about them, and so let them rest.

Afterwards, in a *month*, or *five weeks*, these

these slips (so laid) will have taken Root, (especially if their mould have been watered now and then) then they may be cut off from the old Root, and taken up, and so set again in *fresh, good mould*, prepared in the Garden plat for that purpose: Or else they may be let alone until the *Spring after*, and then set: These *young vigorous Roots*, set in good mould, and watred (now, and then) with *fat water*, will have large flowers: especially if in *June* we break off most of their buds, and suffer only some few, six, or eight, or tenne *flowers* upon a Root, these the Root will easily maintain, and each of them will have the more nourishment, then when they are suffered to spindle up as many as nature will; such must needs be *smaller flowers*, the root being overburdened.

The *Clove-gilly-flower*, is of all other, the best for use; it is well known how useful they are to make *Syraps*, which are very *Cordial*: they are good for *Sallets* prepared with Sugar, to use all the year long, and have the best smell of any other; therefore increase these as much as may be, not only of slips (for slips of these will grow without laying, better then of other kind of flowers) but lay many of them also for more certainty, as is shew'd before.

And

And among these, prefer those which are *largest*, and of the deepest *colour*, and those that are without *Horns* (as they call them) they also are increased of seed, as other kinds.

I have been the larger upon this particular, (and somewhat digressed from the *Experiment*, which chiefly concerned colour) because hereupon mainly depends the *goodness* and *flourishing of a Garden*, as to these kinds of flowers; for if we know not the best way to *propagate flowers*, nor to plant and order them, being prepared, the *Garden* will be but poor.

Experiment. 170. *Whites are more inodorate (for the most part) then Flowers of the same kind Coloured: we find also that blossomes of Trees that are white, are commonly inodorate, as Cherries, Pears, Plums. Whereas those of Apples, Crabs, Almonds, and Peaches, are blushy and smell sweet.*

Observation. I conceive this Experiment was not throughly weighed and tryed; for to my Observation, *white Flowers* have (generally) as much *smell* as those *coloured*: to instance in the *white Rose*, the ordinary kind, and the *white Musk Rose*, I suppose they have as *much smell* (especially the *Musk Rose*) as *Red Roses*, or *Provosts*, or *Velvets*, or *Marble*, and some other coloured

red

red kinds, yea, and more too: And as for some *white flowers*, as the *white Lilly*, and some other kinds, their smell is more full and ranck then many *red*, or other *coloured flowers*: And for *blossomes of Trees*, some that are *white*, smell as much as some that are *red* or *coloured*; for what smell hath the *double blossome Peach-flower*, or the *Nectarine*, or any kind of *Peach blossomes*, which are all *coloured* excellently, more then the *blossomes of Pear-tree*, *Cherry*, or *Plum-tree*, which are said to be *inodorate*: So that there must be some other cause found out, why some *flowers and blossomes* smell not, (or smell not so much as some others) then that which is alleged: *viz.*, the *thinness or scantiness of that substance which moists the Flower*. The *cause* why some *flowers* and *blossomes smell not* so much as *others*, the same is the *cause* why some *flowers* and *fruits* are *bigger* then *others*, and of a better *taste* then *others*; which proceeds (undoubtedly) from the *specifique* or *distinct formal Form* of each particular Plant, which the God of nature hath fixed in it as a Law, which nature never violates, but keeps in all kinds of Creatures.

Contrariwise in Berries, the white is commonly more delicate and sweet in taste, then the coloured; as we see in the white Grapes, white Rasps, white Strawberries, Currants,

Experiments. 508 and 509.

&c. the Cause is, for that the coloured are more juiced, and courser juiced, and therefore not so well and equally concocted.

But in fruits, the white commonly is meaner, as in Plums, the white harvest Plum is a base Plum, the Muscle, Damazeen, and other black Plums, are of the best, &c.

Observation. This proves what was last said to be true, viz. that it is the *Specifical Form* of every Plant, that causeth the difference of tastes in fruits, and smell in *flowers*. For we see by experience, that some *white kinds* of *flowers, fruits, berries*, &c. are *sweeter* and *better* in *smell* & *taste*, then *others* of *coloured kinds*; and likewise other *coloured kinds* of *flowers, fruits*, & *berries*, are *sweeter* & *better* then some *white kinds*; so that it is a hard matter to find out the particular *cause* and give a distinct reason of the differences of particulars, though men may venture at it.

Experiment. 510. *Gilly-flower seed of one kind, being sowen, will come up of several colours: The Cause is* (no doubt) *that in earth, though it be contiguous, and in one bed there are several juices; and as the seed doth casually meet with them, so it cometh forth.*

Observation. It is true, that *Gilly-flower-seed* of one kind sowen, will bring up *several kinds*, some *double* and some *single*: but I much doubt whether it be, for that the *seed meet, with several juices in one bed of earth*; for

for can it be imagined, that two or three very small seeds, that lie as close together as can be, in the earth, should draw several juices from the very self same *mould*, so as to cause them to vary in the colour of the flowers? May it not rather be said, It is from a *Law in Nature*, which God of his general bounty to us, hath put into it; though we stand not in absolute necessity of them, yet in that he gives us such variety and choice? But for men to finde out, and shew *a particular Cause in Nature*, of this variety, will be as hard to do, as to shew a cause why several kinds of grafts upon one Tree, drawing *one and the self same sap*, do yet bring forth different fruits; other than to say, *they keep their several Natures*, and so convert the same sap into several kinds of fruits, according to the distinct specifique intrinsecal form of each particular kind of fruit. And why may not the same be said of *several Seeds* and *Roots* in one *Bed*, drawing the same *juice of the Earth*? See Experiment. 48.

Concerning sowing of *Gilly-flower seed*, I advise those that sow it, first to gather it from the fairest and best *Clove-gilly-flower*, and that it be full ripe, ere it be gathered, which is, when it is turned *black*. Also seed may be gathered from other double Observatio.

flowers; some commend especially the *London white*, others, a flower call'd the *old man head*, and say, the greatest varieties come from these: some are for one, and some for another; but so it is, that *most* will be *single flowers* from the *best seed*; but doubtless there is much in the ground in which the seed is sowen; if it be poor *soyle* they are more like to be more *single*, then if the ground be special *rich mould*; for (as was said) *barren ground*, as it makes flowers small, so sometimes in it, they turn from *double* to *single*, so it may be said as to the seed when sowen.

Experiment. 313. *It is a Curiosity to have flowers double, which is effected by often removing them into new earth, as on the contrary part double flowers, by neglecting, and not removing, prove single; and the way to do it speedily, is to sow, or set seeds, or slips of flowers, and as soon as they come up, to remove them into new ground that is good. Enquire also whether Inoculating of Flowers, (as Stock-gilly-flowers, Roses, Musk-Roses, &c. doth not make them double.*

Observation. For the first part of this *Experiment*, to make *flowers double* or *fairer*, it is a good Rule in the Author hath set down, especially if (without) we observe the directions given in the Observation to the 566 Experiment,

periment, in breaking off some of the *buds* and *stems*, and letting some few grow to be flowers.

There are three ways sufficient for the *propagation* of flowers, which are by *Seeds*, by *Slips*, and by *Layers*, but by *Laying* is by far the best, as is shewed at large in the *Observation* to the 506 *Experiment*. But as for *Inoculating Roses*, (*Musk-Rose*, and all other kinds) that is very common and sure; yet as to the ment of the *Antbory*, viz. (to make them double) it succeeds not: and he himself hath given the Reason, truly, upon another occasion: That is, all Buds and Grafts, rule and keep their own Natures, and so change not, neither as to the making *Roses* more *double* or *better* then they were before, nor as to the *bettering of any Fruit*: as hath been shewed heretofore, *Experiment* 452.

The making of Fruits without Core or Stone, is likewise a Curiosity: If a Cion or Shoot have the Pith finely taken forth, (and not altogether, but some of it left, the better to save the life;) it will bear a fruit with little or no Core or Stone. The like is said to be of dividing a quick Tree down to the ground, and taking out the Pith, and then binding it up again. Experiment. 541.

These prescriptions for making Fruits with- *Observation.*

without *Core* or *Stone*, I cannot think are from this worthy Author, but they are ſuch as are ſet down by others, which I have ſeen; And they are as weak and groundleſs conceits, as many other things aſſerted by them, about *changing the ſpecies of fruits*, and making them of an *aromatique* and *pleaſant taſte*, and altering the colour of Fruits, and ſuch like conceits: the vanity of which (I ſuppoſe) hath been ſufficiently laid open in my *Treatiſe of Fruit-trees*; ſee there *Errors Diſcovered*, pag. 165, 166, &c. For, let this thing be a little conſidered, and it will appear to any man that hath but half an eye, to be vain. Suppoſe a ſhoot or graft, as is here ſaid) be cloven, and all, or moſt of the pith taken out; and admit ſuch a one be grafted (or any way ſet in the ground, ſo as to take root) and grow, yet we know all the bark and buds are as they were before; and taking out the pith, makes no alteration at all, more or leſs: we know in all the *buds* that are *Inoculated*, not onely all the pith, but alſo all the wood is caſt away, and nothing made uſe of but onely the buds and bark of any young ſhoots; and yet we ſee, by continual experience, what the effect is, that theſe *buds* bring forth the ſame fruits, as the Tree from which they were taken.

And

And if a young Tree were divided, and the pith taken out from the top to the Root, (as is said) there is less Reason, (if less can be) that that should work this effect; because all the side twigs, (if it have any) would have pith still; and if it have none, or if the pith were taken out of all, yet we know the increase of the Tree must be still from the *Buds*, which have the same nature in them as *grafts*, or *buds Inoculated*.

Some old Fruit-trees are hollow all along their bodies, having no pith at all, which bring forth *fruits* with no less *Core* or *Stone* for that.

It is very probable, that any soure fruit, grafted upon a stock that beareth a sweeter fruit, may both make the fruit sweeter and more void of the harsh matter of the kernells or seeds. Experiment. 515.

It is reported, that not only taking out the Pith, but the stopping of the juice of the Pith from rising in the midst, and turning it to rise on the outside, will make the fruit without core or stone. Experiment. 516.

The Rule is General; that whatsoever will make a wild Tree, a Garden Tree, will make a Garden Tree to have less Core or Stone. Experiment. 517.

It is true, that a *soure fruit*, grafted upon a stock of a *sweeter kind*, will make the fruit somewhat *sweeter*, yet so as that the graft still governs (as this *Author* elsewhere hath said) and as experience proves; but the fruits will have *kernels* and *seeds* as before. Observation.

Of this, see Page 514.

As for taking out the *Pith*, or stopping the juice of the *Pith*, it is all one as to this intention.

Concerning the *general Rule* in the 517 *Experiment*, know nothing that will make a *Wild-tree*, a *Garden-tree*, but *grafting* it with *good kinds of grafts*: And I am sure *grafting* will not make any fruit to have less *Core* or *Stone*.

Experiment. 518.

Plants for want of Culture, degenerate to be baser in the same kind, and sometimes to change into another kind.

Degenerating of Plants.

1. *By standing long unremoved.*

2. *By drought and dryness of the Earth.*

3. *By the barrenness of the earth, removing Plants into worse mould, or forbearing to renew and help the ground with dungs or fresh mould.*

Observation.

It hath been (*a*) said, That *Violets* and some other flowers, will change from double to single, or change in *colour*, when the mould wherein they grow, becomes *barren* and *heartless* through *neglect*; which is the same in substance with all the three particulars mentioned in the Experiment. Therefore there is need of some fresh mould from year to year, for the preserving of flowers in their perfection. See hereof at large, Experiment 506 and 510.

(*a*) Expe. 506.

Whatsoever Fruit useth to be set upon a root or slip, if it be sowen, will degenerate. And most of those fruits that use to be grafted, if they be set of kernels or stones, degenerate. It is true, that Peaches do better upon stones set, then upon grafting: And the Rule of exception should seem to be this; That whatsoever Plant requireth much moisture, prospereth better upon the stone or kernel, then upon the graft: For the stock, though it giveth a finer nourishment, yet it giveth a scanter than the earth at large. Experiment. 519.

The reason why Fruits that come of seed or stones, do degenerate, (for the most part) and become worse then the Fruits out of which the seed was taken, I conceive to be this; Fruits that come of seed or stones, do partake both of the graft, and of the stock of that Tree from which they were taken; so that although the graft was of a special good, and choice kind, yet the stock whereon it was engrafted, being a Crab-tree, or some other wild kind of Fruit-tree, the seed participates of both graft and stock, and so bring forth a mungel fruit, between them both: For although grafts govern, (as hath been said) and may be said to bring forth the same kinde, yet so as that the stock hath some influence into the fruits, according to the goodness or badness of the stock. Observation.

But

But now, in case the *Tree*, from which *seeds* or *stones* are taken, be an *ungrafted Tree*, one that came of seed it self, then I doubt not, but that the seed of that *Tree*, will bring forth the very same kinds again, without any alteration.

As to that the *Authour* sayes concerning *Peaches*, that they come better of *stones* then *grafting*; I know by *experience* there is a mistake in this; for although it be true, that some *Peaches* will come good of *seed*, yet doubtless not better then by *Inoculating*, (they take not with *grafting*) for we see by constant experience, that *Peach-buds* set upon good *stocks*, will bring forth the very same, as the *Trees* from which they were cut, if the rest of their culture and ordering be the same, or as good.

And as for some that have come of *stones*, I have observ'd they have been none of the best; many that have come of *stones* have been stark nought, though some have been good, and so it is with *flower-seeds*, and all other *seeds of fruits*.

And why *Peaches*, or any other kind of fruit, should be thought to come *better* of *stones* or *seeds*, then by *grafting* or *Inoculating*, I apprehend not any reason: as for that which is given, That *the stock giveth a scanter nourishment, then the earth at large*;

let

ment be considered: The *twigs* and *branches* of a *Peach-tree*, (or any other Tree that came of *seed* or *stones*) they receive Sap and nourishment from a *stem*, or *body*, and *root*, as well as if the *Tree* were *engrafted*: the *twigs* and *branches* of an engrafted Tree, have as free, and full nourishment, (without any obstruction) as the *branches* of an *ungrafted Tree*; the *branches* of a *grafted tree*, have no *finer nourishment*, nor *scanter*, then the *branches of an ungrafted Tree*: for we know the *Root* and *Body* of a *grafted Tree*, and of an *ungrafted Tree*, are alike: and the earth is as free to the *one*, as to the *other*.

It is reported, that a good strong Canvas spread over a Tree, grafted low, soon after it putteth forth, will dwarf it, and make it spread: The Cause is plaine, for that all things grow as they find room. Experiment. 534.

It is true, (as is said) That *Cloth* sometimes spread over a Tree, grafted low, (and suffered to lie on for a time) will cause it to spread much: And that this may be improved for our use and benefit, this may be done: To plant some few *Cherry-trees*, *Plum-trees*, or other kinds, grafted low, and caused to spread much, and kept from rising up by this means; keep the earth bare, clean from *weeds*, *grass*, or any *Observation.*

any thing growing under or about them; such Trees (if they be good kinds) will bear much and fairer fruits, then high trees; the reflection of heat from the earth, will be almost as strong as from a wall. And the fruits may be kept long, growing upon the Tree, even till after *September*, or *October*. For if a *Cloth* be sometimes, in *hot weather*, spread over them, and moistned, it will keep the fruits from *ripening too soon*: (yet shade them not too much, lest they come not to full ripeness.) Afterwards, the fruits being ripe, some old *Canvas*, *hair-cloth*, or such like, may be spread over them, to preserve the fruits from *Birds*, and may be so kept long; (look that *Snails* eat them not.) Or else a Net may be spread over such Trees, to preserve the fruits: I have known faire *Cherries* upon Trees towards the middle of *October*. I conceive the great bearing *Cherry*, or others late ripe, *tart Cherries*, to be the best to keep long, in this manner; such are more hardy then other kinds; *Cherries very late*, are as great *Rarieties* as those that are *early*.

Experiment. 535. *Trees are generally set of Roots or Kernels; but if you set them of slips (as the Mulberry, &c.) they will grow, and those (as is reported) will be dwarf Trees; the cause is for that*

the

the slip draweth nourishment more weakly, then either a Root or kernel.

Mulberry-tree slips, and some other kinds of Trees that will grow of *slips*, may be made *dwarf Trees*, if we will order them accordingly; that is, if we suffer all the *side branches* to grow: or such slips (taking Root) may be made *high Trees* in time, if we cut off all the *side branches*, and preserve only the middle strait shoot. But indeed at first, for certain years, they must needs be *dwarf Trees*, until they can rise higher, which in time they will do, if they take *Root well*, and the *ground be good*. Observation.

In Clay grounds, all Fruit-trees grow full of Moss, both upon body and boughs: which is caused partly by the coldness of the ground, whereby the Plants nourish less, and partly by the roughness of the earth, whereby the sap is shut in, &c. Experiment. 544.

We see by Experience, that *Trees* growing upon *cold* and *moist grounds*, or *Clay*, *Gravel*, *barren Grounds*, do generally *breed Moss*; which is caused (as the *Author* says) by the *coldness* and *scantiness* of the *nourishment*. And therefore there is need (besides the *scraping off of the Moss*) to lay the *Roots of Fruit-trees* as *dry* as may be in such *moist grounds*, by trenching or otherwise, and also to bring in some soyles to make the Observation.

the ground *better* and *warmer*, as much as may be: see of this more at large, *Treatise of Fruit-trees.*

Experiment. 578. *It is to be noted, that (commonly) Trees that ripen their fruits latest, do blossome soonest.*

Observation. Some *Fruit-trees* indeed which bring forth their fruits to perfection and ripeness, late in the year, do blossome early; as having need of the sun to ripen them, all the sommer: But some other kinds blossome early, and ripen their fruits also early; as *May-Cherry-trees*, the *Premorden plum*, also the *Mirabilon Plum-tree* blossomes exceeding early, and the *Tree* brings forth his Fruit early. I have got ripe plums from this Tree about the beginning of *July*, which is early for *Plums*.

Experiment. 579. *There be fruits, (but rarely) that come twice a year, as some Pears, Strawberries, &c. Roses bear twice, but it is not without cutting.*

Observation. The *Windsor Pear-tree* does blossome and bear fruits twice in the year some years, but the second bearing I could never see worth the gathering, for they are poor, small, hard fruits, not worth any thing.

I have seen *Cherries* twice in the year upon one and the same Tree; an early *Flanders*,

Flanders, which I set upon a very warm South-wall, bore ripe *Cherries* about the twentieth of *May*, and the same *Tree* bore ripe *Cherries* afterwards, about the sixth of *October*.

Strawberries ordinarily bear twice a year, though but few the second time. As for *Rose-trees*, some *Damask Roses*, and some *Provens*, bear a second time the same year, though but few, if cut soon after the first bearing in the full Moon. But besides, there is a *Rose-tree* call'd the *Monthly Rose*, which bears *Roses* until the coldness of the Winter stop it, about *November*.

Nothing procureth the lasting of Trees, Bushes, and Herbs, so much as often cutting; For every cutting causeth a Renovation of the juice of the Plant, that it neither goeth so far, nor riseth so faintly, as when the Plant is not cut. Experiment. 586.

This is to be considered in *cutting of Trees*, else instead of making them last longer, we shorten their lives. That is, that we so cut them, that the wet and moisture get not into their bodies, which in certain years will rot and spoil them; as we see in many *Pollard-trees*, which are hollow all along their bodies. And many *Fruit-trees*, having had their heads cut off, when they were great Trees, and grafted again; Observation.

we

we see the wet and moisture gets in at the top, before the grafts can cover the head, and rots the Tree, which can never grow great after, nor last long, but rots and decays in few years. Whereas Trees that are sound, (*Fruit-trees*, and all other kinds) must needs last much longer: by cutting off side branches, and all superfluous branches, (which are not great) that conduceth to the lasting of Trees, as giving the *more plentiful* and *vigorous nourishment to those that are left, and to the whole body.*

The VII. CENTURY.

Experiment. 624.

Quinces or Apples, if you will keep them long, drown them in Hony, but because Hony (perhaps) will give them a taste overlusious, it were good to make tryal in powder of Sugar, or in surrup of Wine onely boyled to height.

Observation.

As for keeping of *Apples*, keeping them in Hony or Sugar, would be too costly: some *Pippins* and *John-Apples*, will (of themselves) last till new come again: it's good then to get such kinds, that we may have for use all the year long, without charge in keeping.

And

And for keeping *Quinces*, they are kept long in pickle, made of the Parings and Cores (of thoſe that are uſed for *Marmalade*) well boyled in water, with Salt and Ginger. Or a better way (as ſome account) is to keep them in ſmall Ale a penny a Gallon, and to draw it off once in ten or twelve days, and put in freſh; thus its ſaid they will laſt two years.

Take Grapes and hang them in an empty Veſſel well ſtopped, and ſet the Veſſel not in a Celler, but in ſome dry place, and its ſaid they will laſt long. Experiment. 627

Grapes will keep for ſome ſhort time in this manner, as hath been ſaid; but when cold moiſt Aire towards *Winter* comes on, they will begin to mould and rot: I have kept ſome in *Glaſs*, as cloſe ſtopt with *cork*, and *wax*, as I could, ſuppoſing the excluſion of Air had been beſt, but though they were good certain weeks, yet afterwards they began to periſh: I account it better to hang the bunches in a *Kitchin*, or ſome warm *Room* where *fire* is much kept, that ſo ſome of their ſuperfluous moiſture may be a little dried up; I have kept them thus many weeks. For though the Aire be much ſhut out from them in any *Veſſel*, yet that Aire that is ſhut in with them, and their own natural moiſture, will cauſe pu- *Obſervation.*

treſaction; therefore there is need of ſome degree of warmth with dryneſs: Cut off ſome of the wood with the bunches, and cover them with paper from duſt, and hang them up in the *Kitchin*, or where fire is kept.

Alſo a *Vine branch* full of *ripe Grapes*, may be drawn in at a window, and nailed up upon the wall or ſeeling, letting the branch grow ſtill to the Vine, thus they will keep long.

Experiment. 633. *The juices of Fruits are either watry, or oylie: I reckon amongſt the watry, all the fruits out of which drink is expreſſed, as the Grape, the Apple, the Pear, the Cherry, the Pomegranate, &c. And there are ſome others, which though they be not in uſe for drink, yet they appear to be of the ſame nature, as Plums, Mulberries, Services, Raſps, &c. And for thoſe juices that are ſo fleſhie, as they cannot make drink by expreſſion, yet perhaps they may make drink by mixture of water. And ſome of the watry juices, after they have gathered ſpirit, will burn and inflame as Wine.*

Obſervation. Concerning the juices of *Apples*, *Pears*, and *Cherries*, theſe are well known, and much in uſe and eſteem; the two former with us in *England*, and all of them in other parts: And we might have *Wine* of *Cherries*

Cherries as plentifully in *England*, as it is beyond Sea, if men would but plant ſtore of *Cherry-trees* of the *beſt kinds*, ſuch as are fitteſt for this purpoſe, as the *Morello Cherry*, the *Charoon*, the *Black-hart*, and other kinds which have a pleaſant taſte, the juice of which is of a deep *red colour*: Theſe would make a delicate Wine, eſpecially for *Sommer time*, and which will laſt alſo all the year, as I have heard it credibly ſpoken by a worthy Gentleman, who drank good *Cherry Wine* of a *Twelve month old*.

As for *Cider* and *Perry*, theſe *Liquors* (eſpecially *Cider*) begin to be better known to us, in ſome parts where they have ſcarce been heretofore: And doubtleſs when men are better acquainted with them, and know their good properties and virtues, in reference to health and long-life, they will be more diligent in planting *Fruit-trees*, ſuch as are beſt and fitteſt for this purpoſe, as the *Pearmain*, *Pippin*, *Gennet-moyle*, *Redſtreak*, and ſuch like, which make *Cider* better then *French-wine*.

Concerning the *manner* of making *Cider* and *Perry*, with the keeping and ordering of it, I have ſpoken at large in my *Treatiſe of Fruit-trees*: See the uſe of Fruits, pag. 144, 145, *&c.*

See Maſter *Hartlibs* Legacy of Husbandry pag. 27.

As for *Plums*, it is affirmed, that there may be made an excellent Wine out of them, and alſo *Aquavitæ*, of thoſe that are ſweet fat Plums, as *Muſle-plums*, *Damſons*, &c. And though the juice be too thick of it ſelf for that purpoſe, yet *Water*, *Cider*, or ſome other liquor, may be mixed therewith, which being put up into the Veſſel, ſome *Hony*, *Yeſt*, (or the like) muſt be mixed, to cauſe it to work.

Experiment. 634.

It hath been noted, that moſt Trees (and ſpecially thoſe that bear Maſt) are fruitful but once in two years. The cauſe (no doubt) is the expence of ſap; for many Orchard Trees well cultured, will bear divers years together.

Obſervation.

Some Fruit-trees bear ſtore of fruits but once in two years, and I conceive it to be as natural for ſome kinds ſo to do, as to bear ſuch or ſuch a *kind of fruit*. And others are obſerved to bear ſtore of Fruits every year conſtantly, unleſs (perhaps) in ſome extream blaſting ſpring, which ſpoils (in a manner) all: But for many years together every year, ſome are known to bear Fruits exceeding full in the ſame ground, and with the ſame culture, as thoſe that bear but each other year: ſo that we ſee the expence of ſap, in the bearing *year*, is not the only *cauſe* that Trees bear not the next year after; for ſome that expend

as much ſap, do yet bear the next year after as full as before: So then, let care be taken, to chuſe grafts from thoſe Trees that we ſee by Experience are the beſt, and moſt conſtant bearers, and beſt fruits.

Experiment. 637. *The greater part of Trees bear moſt, and beſt on the lower boughs, but ſome bear beſt on the top boughs. Thoſe that bear beſt below, are ſuch as ſhade doth more good to then hurt; for generally all fruits bear beſt loweſt, becauſe the ſap tireth not, having but a ſhort way; and therefore in fruits ſpread upon walls, the loweſt are the greateſt.*

Obſervation. To my obſervation, *Apple-trees, Pear-trees, Cherry-trees,* &c. that are *good bearers,* they bear all over alike. And generally all *Fruit-trees* in theſe parts, have need enough of the Sun, and bear better in the Sun then in the ſhade; but indeed as to *Wall trees,* moſt commonly we ſee moſt fruit upon the lower *boughs,* and ſide *branches,* * and the Reaſon I apprehend to be this: Not the tiring of the ſap in its going to the top branches; for the ſap is *too vigorous,* and *too plentiful,* in the *top boughs,* and thence it is we always ſee the faireſt and greateſt ſhoots towards the *top* of all *Wall-trees,* and commonly of all

* Therefore obſerve the directions given in the *Treatiſe of fruit trees,* p. 131, 132, &c. in cauſing the branches to ſpread along the wall both ways, which cauſeth fruitbearing.

other Trees. But the cauſe why the lower boughs, and ſide branches, have uſually more fruit then the top branches, I conceive to be for that the ſap naturally preſſeth upwards in greateſt plenty, and runeth forth into ſhoots and branches: Now nature being ſo intent, and vigorouſly active in one work (*viz.* the increaſe of the Tree in thoſe branches) it doth not put forth it ſelf at the ſame time, in that other *effect* of bearing fruit upon the ſame branches. But now, as to the lower boughs, and ſide branches, there nature is at work, but in a remiſs and weaker degree as to the increaſe of the branches; ſuch grow but little, becauſe the ſap is ſomewhat obſtructed, and curbed by bowing the branches downwards, and ſo does attend to the other work alſo, *viz.* the *bearing* of *Fruits*.

And the truth of this is made more evident, if we conſider the ſame thing in all young Trees: We know young *Apple-trees*, *Pear-trees*, and the like, when and while they grow, and increaſe exceedingly in all the parts, ſhooting forth great, large, ſtrong ſhoots and branches, they bear but little fruit, or none at all: But after certain years, when they grow not ſo much, when they ſhoot leſs, then they

fall

fall to bearing fruits more abundantly.

There be Trees that bear beſt when they begin to be old, as Almonds, Pears, Vines, and all Trees that give Maſt. The Cauſe is, for that all Trees that bear Maſt, have an oyly fruit; and young Trees have a more watry juice and leſs concocted. But the moſt part of Trees, amongſt which are Apples, Plums, &c. bear beſt when they are young. Experiment. 638.

Pear-trees, Apple-trees, Plum, and *Cherry-trees,* if they be good bearing kinds naturally, after they are three or four years growth (and ſome *ſooner*) do all bear ſtore of fruits, until they be extream old, and in a decaying, dying condition: And therefore in planting of *Fruit-trees,* be ſure to procure thoſe kinds that are known by *experience* to be *good* bearers and *good* fruits; and ſuch will bear well, both when they are young, and when they are old, until extream age. *Obſervation.*

Were I to Plant an *Orchard,* or *Garden of Fruit-trees,* and might have Trees at hand freely for nothing, of *indifferent common kinds,* and but indifferent bearers; I would rather *chuſe* to fetch thoſe that are choice kinds, and ſpecial bearers, one hundred or two hundred Miles, (if they could not be had nearer) and there pay dear for them too, beſides all other charges;

then take thoſe at hand, for when men plant *Fruit-trees*, it is not for a few years, but for ſeveral Generations: therefore take ſpecial care to have the beſt kinds for bearing, and for reliſh or taſte: that is the foundation of the work, the principal thing in planting.

Now, when *Fruit-trees* are grown to extream old age, and therefore bear but little, this may be done, which will make them (as it were) young again for certain years, and to bear exceeding much fruit yearly: That is, Cut off their heads, or big boughs, not ſtrait over, but a ſlope, that ſo rain and moiſture may not reſt upon the top to rot it: Theſe great boughs will (the next Sommer) put forth many young ſhoots, which may be inoculated the ſame Sommer, or grafted the Spring after with ſpecial bearing kinds: And theſe old bodies, having young heads, (which draw ſap vigorouſly) will be much refreſhed thereby; and ſuch Trees will bear ſtore of fruits many years after.

Experiment. 653. *The Roots of Trees do (ſome of them) put downwards, deep into the ground; as the Oak, Pine, Firre, &c. ſome ſpread more towards the ſurface of the earth; as the Aſh, Cypreſs-tree, Olive, &c. The cauſe of this later may be, for that ſuch Trees as love the Sun,*

Sun, do not willingly deſcend farre into the Earth.

It is true, The *Roots of Oak-trees*, and ſome other kinds, ſhoot down deeper into the earth then *Aſh-trees*, and ſome other *Trees*: May not the Reaſon be (why ſome put their Roots deeper then others) becauſe thoſe Trees have greater and larger bodies then others; and Nature lays the foundation anſwerable to what is to be ſet upon it: Now *Oakes* being the greateſt Trees, Nature is wiſe enough (according to a Law God hath put into into it) to make the Root or Foundation *anſwerable*; Otherwiſe, I conceive the Roots of all Trees would be as near the top of the ground as may be, as loving the Sun, as having an abſolute need of it in order to their growth: And I am perſwaded, that the appetite of the ſpirit, in all Trees whatſoever, (one as well as another) is upwards, and not downwards; and never exerts it ſelf downwards, but upon neceſſity; and in order, or in ſubordination, to the growth of the body of the Tree above ground. *Obſervation.*

It hath been obſerved, that a branch of a Tree, being unbarked ſome ſpace at the bottom, and ſo ſet into the ground, even of ſuch Trees as if the bark were ſet on, they would not grow; Experiment. 654.

grow; yet contrariwiſe, we ſee that a Tree pared round in the body above ground, will die: The cauſe may be for that the unbarkt part draweth the nouriſhment beſt, but the bark continueth it only.

Obſervation. It is true, ſome branches that are unbarkt at the bottome, and ſet in the *ground*, will grow, of ſome kinds of *Apples*, as the *Quodling*, *Nurſgarden*, *Moyle*, and ſome other kinds that have ſoft barks: Not becauſe (not the ſooner) for that the branch is unbarkt, for ſuch will grow of cuttings of ſlips, though they be not at all unbarkt; And thoſe that be unbarkt and grow, it is not the unbarkt part that draweth nouriſhment beſt, nor that draweth it at all; but the Roots put forth from the bark, even at the very adge of the cut part, and alſo ſome break out of the bark where it is not cut; As we ſee in thoſe branches of Trees from which we get Roots while they grow upon the Tree, by disbarking of them, an inch round, and tying mould about: See how at large, *Treatiſe of Fruit-trees*, pag. 136.

Experiment, 668. *The grafting of Vines upon Vines (as I take it) is not now in uſe; the Antients had it, and that three ways, The firſt was inſition, which is the ordinary manner of grafting. The ſecond was Terebration through the middle,*

dle of the ſtock, and putting in the Cions there. And the third was, paring of two Vines that grow together to the marrow, and binding them cloſe.

I have tryed ſeveral ways to graft *Vines*, by cleving or inſition, (as the Author calls it) and alſo by paring two Vines, the ſtock and graft on two ſides, which is my uſual and beſt way of grafting other fruit-trees, but neither took effect; ſo that I am perſwaded thoſe Fruit-trees that are ſo eaſily propagated by other means, as by laying down the branches into the earth, and by cuttings, that theſe will not take with grafting or inoculating; as *Vines*, *Mulberries*, &c. I have tried many exreriments about *Mulberries*, both for grafting and inoculating upon ſeveral kinds of ſtocks, and yet none ſucceeded: but *Mulberries* are increaſed by laying down the branches, and by cuttings, as Vines are: ſo that I conceive this graftiug, mentioned by ſome Ancient Authors, is but a conceit of theirs, (a grafting in the brain) inſtead of a real Experiment, like multitudes of other things, recorded by ſome who (its probable by what they ſay) had no Experimental knowledg in the things they ſpake. *Obſervation.*

See the obſervation upon the 477 Experiment.

As for Maturation of fruits, it is effected by heat, motion, attraction; and by a rudi-

Experiment. 316.

ment

ment of putrefaction, for the inception of putrefaction, hath in it a maturation.

Obſervation. Concerning the *maturation* or ſpeedy ripening or concocting of Fruits, all kinds of heat (as the Author ſayes) haſteneth it faſter or ſlower, according to the degree of heat; as we ſee by experience, *Apples* or *Pears* laid upon a heap together (being newly gathered) they mellow, and ripen faſter then if they lay ſingle at diſtance one from another. Alſo *Apples* covered in *Lime, Hay, Straw, &c.* will be mellow in a ſhort time: But the moſt ſpeedy way to ripen hard fruits, and to abate the groſſe tartneſs of them, is the common Experiment by a gentle heat before the fire, or in an Oven after bread is drawn.

So we ſee (as the Authour obſerves) if fruits are eat with *Waſps, Hornets, Birds, &c.* ſome part of them, the reſt ſweeten and ripen ſooner; putrefaction beginning, and haſtning by reaſon of ſolution of continuity in that part.

Experiment. 343. *We ſee that Beer or Wine in Bottles, cloſe ſtopped, laſts long; and that fruits cloſed in wax, keep freſh: And likewiſe bodies put in Hony and Flower, keep more freſh.*

Obſervation. It is true, that Liquors when they are well ſetled in the Veſſel, (after a certaine time) and after drawn out into bottles, and

and ſtopped very cloſe with *Cork*, and ſet in a *Celler*, or buried in ſand, or in water, ſuch will be much more freſh and quick then the ſame *Liquor* in a great Veſſel, eſpecially if any part of it be drawn off: And therefore this is a good way to keep *Cider*, *Perry*, *White-wine*, or the like, and that for a long time together.

As for Fruits cloſed in wax, or put in hony, I find that even Cherries (which are more ſubject to corruption then many other kinds of fruits) will keep freſh many weeks together thus, more then they will do of themſelves in the open Air: excluſion of Aire preſerves them for a time, but yet putrefaction at length will work within, becauſe of the ſuperfluous *moiſture*, which had need of drying up. I have tried fruits in honey (*Aprecots*, *Plums*, *Cherries*) and they held good two or three Months; afterwards putrefaction began.

Experiment. 378. *A Bottle of Beer buried four foot deep in the ground, became more lively, better taſted, and clearer, then it was; and a Bottle of Wine in like manner: A bottle of Vineger ſo buried, came forth more lively, and more odoriferous, ſmelling almoſt like a Violet after a Months burial, all three they came forth, as freſh and lively, if not better then before.*

This

Obſervation. This is certain, That *Beer*, *Ale*, *Cider* and *Wine*, when well ſetled, and cleared in the Veſſel, and drawn off into Bottles, and well ſtopt with *Cork* and *Wax*; will continue freſh and good, much longer then in the Veſſel, and will alſo improve in goodneſs. If the bottles are buried in ſand, (as was ſaid before) or buried a yard or more in the ground: The reaſon I conceive is, for that as no Aire can poſſible penetrate ſo deep, and through the bottle to the liquor, nor can the ſpirits of the liquor (in the leaſt) get out: ſo neither can the Liquor ſuffer any prejudice by alteration of the *Aire* from heat to cold, as it does in Veſſels above ground.

Experiment. 385. *Tryal hath been made with earthen Bottles well ſtopped, hang'd in a Well of twenty Fathom deep at the leaſt; and ſome of the bottles have been let down into the water, ſome others have hanged above, within a Fathome of the water: Wine and Beer in theſe Bottles, have kept better then in a Celler, but thoſe above water were apparently the beſt.*

Obſervation. The *Cauſe* why *Beer*, *Wine*, *Cider*, or the like, will keep better thus, and in *Earth*, *Sand*, &c. (as before) then in *Veſſels* or *Bottles* above ground, I apprehend (as was ſaid) for that the Aire is excluded, and the ſpirits ſhut in: alſo the Aire above ground

is

is ſubject to variation, ſometimes more hot, and ſometimes more cold: which ſomewhat ſtirs, and *affects* the ſpirits of the Liquor in the Veſſel, whereby they become weaker.

I have heard it Reported for a Truth, That Bottles of Wine, (or ſome other Liquor) were found in a deep *Draw well*, which had been many years fill'd up, and afterwards opened, and cleanſed again for uſe; and the Liquor was found to be very freſh and good, notwithſtanding it had lyen there many years; whereby it is manifeſt, that this way of keeping Liquors, will preſerve it good along time.

The IX. *CENTURY.*

Experiment. 854.

WE have partly touched before, the means of producing fruits without cores or ſtones: And this we add further, that the cauſe muſt be abundance of moiſture, for that the core and ſtone are made of a dry ſap; and we ſee that it is poſſible to make a Tree put forth only in bloſſome without fruit, as in Cherries with double flowers, much more in fruit without ſtone or cores.

Obſervation.

This hath been ſpoken too ſufficiently before, See *Experiment* 514. It is neither the taking out of the pith, as is there preſcribed; nor the *abundance of moiſture*, as here,

here, that will work this *effect*: some *Trees* have *too much moisture*, and yet the *fruits* of such have *nevertheless cores* or *stones*.

As for the *Cherry-tree* that puts forth double *blossomes without Fruits*, that is not made to do so by any mans *Art* or *Skill*: but it is natural: I know the kind well, it is as natural for it to bear *double blossomes without fruit*, as for any other tree to bear such or such a kind of fruit.

Experiment. 856. *Trees set upon the backs of Chimneys, do ripen Fruits sooner: Vines that have been drawn in at the Window of a Kitchen, have sent forth Grapes ripe a month before others.*

Observation. This is certain (as the Author says) such a kind of heat, as is upon the *back of Chimneys*, where fire is continually, or most commonly kept, will much hasten the *ripning of fruits*. I have seen a *thin Brick wall* where fire hath been kept on the one *side*, and *fruit-trees* have been Planted on the other side, which have brought forth ripe fruits very early, much sooner then the same kinds without such artificial heat.

And *Branches of Vines* being drawn in at the *window of a Kitchen*, or room where fire is kept: the fruits will be ripe sooner then those without dores: but let it not be too near the fire, lest it *wither*, or over much *dry the branch*.

FINIS.